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TRANSACTIONS

OF THE

London Natural History Society

For the Year 1919.

Price Three Shillings.

PUBLISHED BY THE
LONDON NATURAL HISTORY SOCIETY,
HALL 10, WINCHESTER HOUSE, OLD BROAD STREET, E.C.2.
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1920.

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LIST OF MEMBERS.

It is particularly requested that Members will inform the Secretaries as soon as possible of any change of address.

HONORARY MEMBERS.

Grant, G. F., Beaumont Manor, Wormley, Broxbourne, Herts. (Arch.)
Huckett, T., New North Road, Islington, N. 1. (Lep.)
Massey, Herbert, F.E.S., Ivy Lea, Burnage, Didsbury, Manchester. (Lep., Orn., Ool.)

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Aris, E. A., 9, Oak Avenue, Priory Road, Hornsey, N. 8. (Lep.)
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Baker, W. E. Watson, 313, High Holborn, W.C. 1. (Micr.)
Barnes, H. J., "Mount Echo," Chingford, E. 4.
Barnes, R. C., "Loën," Grange Avenue, Woodford Green.
*Battley, Mrs., 6, Craven Avenue, West Ealing, W. 13.
Bayne, Charles S., "Hill Rise," Paddockhall Road, Haywards Heath, Sussex. (Orn.)
Beattie, W., 8, Lower Grosvenor Place, S.W. 1. (Lep.)
Bell, William H., "Hillcrest," 74, Sylvan Avenue, Wood Green, N. 22. (Lep.)
Bird, E. J., 107, Whipps Cross Road, Leytonstone, E. 11.
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Blum, Victor, 23, Valentine's Road, Ilford. (Lep.)
Bowman, R. T., 68, Mornington Road, Chingford, E. 4. (Lep.)
Bradley, S. W., 12, Glebeland Avenue, South Woodford, E. 18. (Lep. Chem. Ast.)
Braithwaite, J. O., 18, Warren Road, Chingford, E. 4. (Micr., Bot., Ent.)
Braithwaite, Miss N. A., 18, Warren Road, Chingford, E. 4.
Brierley, C. H., 16, Tavistock Square, W.C. 1. (Micr.)
Brown, A., 44, Ravensdale Road, Stamford Hill, N. 16. (Orn., Arch., Geol.)
Burkill, H. J., M.A., F.R.G.S., 79, Cornhill, E.C. 3. (Plant galls, Lep., Bot., Geol.)
Burrows, Rev. C. R. N., The Vicarage, Mucking, Stanford-le-Hope, Essex. (Lep.)
Capleton, A., 67, Queens Road, Leytonstone, E. 11. (Mam.)
Capleton, J. H., 75, Queen's Road, Leytonstone, E. 11.
Chapman, E., The Cottage, Ivy Lane, Woking. (Arch., Geol.)
Chapman, Dr. T. A., F.Z.S., F.E.S., "Betula," Reigate. (Lep.)
Clark, J. W., "Hazeldene," The Ridgeway, Chingford, E. 4. (Bot.)
Cockayne, E. A., M.A., M.D., F.R.C.P., F.E.S., 65, Westbourne Terrace, W. 2. (Lep., Biol.)
Collenette, C. L., c/o Barker & Co., Ltd., Penang, Straits Settlements. (Bot., Orn., Dipt.)
Cooper, B., 103, Bethune Road, Stoke Newington, N. 16 (Lep., Bot.)
Cox, Oswald F., "Croftdown," Shepherd's Hill, Highgate, N. 6. (Bot.)
Crabtree, B. H., F.E.S., "Hollybank," Alderley Edge, Cheshire. (Lep.)
Cross, F. B., Park Villa, 65, Bruce Grove, Tottenham, N. 17. (Lep.)
Cyriax, R. C., 23, Aberdare Gardens, West Hampstead, N.W. 6. (Arch., Aryan question, Indo-European languages.)
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Daniell, V. W. L., 69, Talbot Road, Highgate, N. 6.

Dell, F. G., "The Hut," Russell Road, Buckhurst Hill, Essex. (Pond life, Micr.)
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Digby, Howard, "Keneric," Monkhams Avenue, Woodford Green. (Geol., Orn.)
Douglas, J., "Thorncote," Chellaston, Derby. (Lep.)
Edelsten, H. M., F.E.S., "The Elms," Forty Hill, Enfield. (Lep.)
Eynon, Lewis, B.Sc., F.I.C., 41, Champion Road, Upminster, Essex. (Chem.)
Gamble. Rev. J. H., B.A., 14, Frederick Road, Chingford, E. 4.
Gardner, J. E., "Clive," Hengistbury Road, Southbourne, Bournemouth. (Lep., Bot.)
Gaze, W. E., 10, The Avenue, Highams Park, Chingford, E. 4. (Lep., Bot., Chem.)
Gerrard, V., 10-11, Mincing Lane, E.C. 3. (Lep.)
Glegg, W. E., The House, Albion Brewery, Whitechapel Road, E. 1. (Orn.)
Greengrass, Miss Madeleine, "Elmfield," 51, The Ridgeway, Chingford, E. 4. (Lep.)
Greenwood, M., M.R.C.P., M.R.C.S., "Hillcrest," Church Hill, Loughton, Essex. (Arch., Biol.)
Gwatkin-Williams, Captain R. S., R.N., Savage Club, Adelphi, W.C. 2. (Lep.)
Hall, L. B., F.L.S., 28, Station Road, Winchmore Hill, N. 21. (Bot., Galls., Biol., Geol., Micr.)
Hanbury, Frederick J., F.L.S., F.E.S., Brockhurst, East Grinstead. (Bot. Lep.)
Hanbury, F. Capel, 37, Lombard Street, E.C. 3. (Lep.)
Hanson, P. J., "Burcroft," Village Road, Bush Hill Park, Enfield. (Orn. Arch.)
Hanson, Mrs., "Burcroft," Village Road, Bush Hill Park, Enfield.
Harvey, F. B., "The Nook," Rhodes Minnis, Elham, Canterbury. (Lep.)
Hayward, H. C., The Croft, Repton, Derby (Lep.)
Heath, G. H., M.A., 277, Brockley Road, S.E. 4. (Lep.)
Hodge, A. E., 14, Astonville Street, Southfields, S.W. 18. (Lep., Rep., Icht.)
Horn, P. W., 10, Sheringham Gardens, Romford, Essex. (Orn., Aquaria.)
Howard, D. Lloyd, J.P., F.I.C., F.C.S., Little Friday Hill, Chingford, E. 4. (Chem.)
Jackson, F. W. J., 2, The Grove, Wimbledon Common, S.W. 19. (Lep.)
James, Russell E., c/o Messrs. James Priestley, Sun Court, Golden Lane, E.C. 1. (Lep.)
*Kaye, W. J., F.E.S., "Caracas," Ditton Hill, Surbiton, Surrey. (Lep.)
Kind, H. A., 63, Empress Avenue, Woodford Green. (Lep.)
King, W. E., 64, Huntingdon Street, N. 1. (Lep.)
Latham, E. B., "Hillside," Epping New Road, Buckhurst Hill, Essex. (Orn.)
Latham, Russell, "Hillside," Epping New Road, Buckhurst Hill, Essex. (Api., Orn.)
Legg, T. E., "Tintern," Mornington Road, Woodford Green. (Orn., Arch., Bot., Mam.)
Leyton Public Libraries, per the Librarian (Z. Moon, F.R.Hist.S.), Central Library, Leyton, E. 10.
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Maitland, Donald F., May Cottage, Harold Wood, Romford. (Lep.)
Mann, F. G., 21, Thurlby Road, West Norwood, S.E. 27. (Lep.)
Mera, A. L., 5, Park Villas, High Road, Loughton, Essex. (Lep.)
Mera, A. W., 5, Park Villas, High Road, Loughton, Essex. (Lep.)
Moore, J. E., 6, Alwyne Villas, Canonbury, N. 1.
Murray, C., Uphall Farm, Ilford. (Lep., Bot., Orn., Geol.)
Murray, L. C., 165, Fox Lane, Palmer's Green, N. 13. (Ent., Geol., Bot.)
Mutch, J. P., 405, Hornsey Road, N. 17. (Lep.)
Newbery, E. A., 13, Oppidans Road, Primrose Hill, N.W. 3. (Col.)
Newman, L. W., F.E.S., 41, Salisbury Road, Bexley, Kent. (Lep.)
*Nicholson, Miss B., 202, Evering Road, Upper Clapton, E. 5. (Bot.)
Nicholson, C., F.E.S., 35, The Avenue, Hale End, Chingford, E. 4. (Ast. Bot. Ent. Micr., Plant Galls, Pond Life.)
*Nicholson, Mrs. E.A., 42, Avenue Road, Highgate, N. 6. (Bot.)
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Peacock, F. G., "Brierlea," Stormont Road, Highgate, N. 6. (Mam.)
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Pearce, J. P., "Higham Court," Woodford Green. (Orn.)

Pickett, C. P., F.E.S., 28, Colworth Road, Leytonstone, E. 11. (Lep.)
Prout, L. B., F.E.S., 84, Albert Road, Dalston, E. 8. (Lep., Biol.)
Raven, Rev. C. E., 4, Park Terrace, Cambridge. (Lep. and Orn.)
Riches, J., 52, Calverley Grove, Hornsey Rise, N. 19. (Lep., Bot.)
Robbins, R. W., "The Rosery," Limpsfield, Surrey. (Bot., Lep., Orn., Arch.)
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*Ross, J., 18, Queens Grove Road, Chingford, E. 4. (Bot., Plant Galls.)
Routledge, G. B., F.E.S., Tarn Lodge, Headsnook, Carlisle. (Lep. Col. Hem.)
Russell, Rev. Canon, M.A., The Chantry, Chingford, E. 4. (Mam., Arch.)
Sabine, L. A. E., 10, Franconia Road, Clapham Common, S.W. 4. (Lep.)
Samuelson, Edward, Fairview, 39, The Ridgeway, Chingford, E. 4. (Mam., Rep., Bot., Icht., Ethn.)
Sarvis, John, May Cot, Maybury Hill, Woking. (Lep., Bot., Hym.)
Shaw, V. Eric, "Betula," Park View Road, New Eltham. (Hym. Lep. Micr., Api.)
Sich, Alfred, F.E.S., Corney House, Chiswick, W. 4. (Lep., Conch.)
Simes, J. A., F.E.S., "Greenacres," Woodside Road, Woodford Green. (Lep., Orn.)
Simpson, W., M.B., B.S., "Polmennor," Snakes Lane, Woodford Green. (Arch. Bot., Lep., Plant Galls.)
Smith, A. C., "Horton," Mornington Road, Woodford Green. (Ent.)
Smith, C. B., 61, Onslow Gardens, Muswell Hill, N. 10. (Lep.)
Stemp, R., Hinton Villa, Heathcote Grove, Chingford, E. 4.
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Stuart, Vernon, 78, Elgin Crescent, Notting Hill, W. 11. (Lep.)
Tautz, P. H., F.E.S., Cranleigh, Pinner, Middlesex. (Lep.)
Tebb, R. N. S., The Old Lodge, Epsom. (Lep.)
Thomas, G. O., "Wilfrid Lawson Hotel," Woodford Green.
Todd, R. G., F.E.S., "The Limes," Hadley Green, Barnet. (Lep.)
Tremayne, L. J., 29-30, Charing Cross, S.W. 1. (Bot. Lep. Arch., Plant galls, Orn.)
Tremayne, Mrs., 29-30, Charing Cross, S.W. 1. (Orn., Arch., Bot.)
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Warren, S. Hazzledine, F.G.S., F.Z.S., "Sherwood," Loughton. (Prehistoric Anthropology, Geol.)
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Fulcher, Miss, "St. Helens," Woodland Road, Chingford, E. 4.
Halloway, Miss M., 19, Buxton Road, Chingford, E. 4.
Halls, Mrs. E. W., The Bank House, Chingford, E. 4.
Halls, J. H., The Bank House, Chingford, E. 4.
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Hubbard, Mrs., 110, Station Road, Chingford, E. 4.
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Kilby, G. S., 54, Lombard Street, E.C. 3.
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Lewis, T. G., 61, Empress Avenue, Woodford Green.
Loram, H. Y., 49, Buxton Road, Chingford, E. 4. (Geol.)
Mancell, Mrs. A. W., 4, Connaught Avenue, Chingford, E. 4.
Mancell, Miss M., 4, Connaught Avenue, Chingford, E. 4.
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Stratton, Miss Isabel, 37, Buxton Road, Chingford, E. 4.
Thomas, G. W., 86, James Lane, Leyton, E. 10. (Orn., Bot.)
Young, J., 87, Station Road, Chingford, E. 4.

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Allen, William, "Southview," Spa Road, Radipole, Weymouth. (Bot.)
Allnutt, C. E., "Kyle More," Railway Approach, Worthing. (Arch.)
Bickham, Spencer H., Underdown, Ledbury. (Bot.)
Blackburne, F. W., "Chatsworth," Carlisle Parade, Hastings. (Micr.)
Blake, Wm., Acacia Villa, Ross, Herefordshire. (Orn. & Conch.)
Bostock, E. D., Oulton Cross, Stone, Staffordshire. (Lep.)
Buckley, G. G., M.D., F.S.A., Rye Croft South, Manchester Road, Bury. (Lep., Dip.)
Butler, W. E., F.E.S., Hayling House, Oxford Road, Reading. (Lep.)
Cassall, Dr. R. T., F.E.S., The Surgery, Abertillery, Mon. (Lep.)
Cooke, Rev. P. H., M.A., Ickleton Vicarage, Great Chesterford, Essex. (Bot.)
Culpin, M., M.B., F.R.C.S., Slyder's Gate, Loughton, Essex. (Biol.)
Elford, Rodney R., Glencoe House, 139, Rosary Road, Norwich. (Ent.)
Fison, Eliot Robert, "Sorrento," Brighton Road, Purley.
Grubb, Walter C., Barberton, Transvaal. (Geol.)
Hancock, G. D., Mount View, Uffculme, Cullompton, Devonshire.
Hopkins, Prof. F. G., M.A., M.D., F.R.C.P., F.R.S., 71, Grange Road, Cambridge. (Biochemistry.)
Longley, W., "Avesbrook," Brook Road, South Benfleet, Essex. (Lep.)
Miller, Miss E., "The Croft," Rainsford Lane, Chelmsford. (Lep.)
Moore, J. W., Middleton Dean, Middleton Hall Road, King's Norton, Birmingham. (Lep.)
Pike, Oliver G., "Duncombe," Marsworth, Tring. (Orn.)
Porritt, G. T., Elm Lea, Dalton, Huddersfield. (Lep., Neur., Orth.)
Portway, J. B., jun., 91, The Avenue, West Ealing, W. 13.
Studd, E. F., M.A., B.C.L., F.E.S., Exeleigh, Starcross, Devon. (Lep.)
Ward, J. Davis, "Limehurst," Grange-over-Sands, Lancs. (Lep.)
Wood, P. Worsley, M.A., Emmanuel College, Cambridge. (Field Botany).

Note. — The following abbreviations are used in the above lists :— Api., Apiculture; Arch., Archaeology; Ast., Astronomy; Biol., Biology; Bot., Botany; Chem., Chemistry; Col., Coleoptera; Conch., Conchology; Dipt., Diptera; Ent., Entomology; Ethn., Ethnology; Geol., Geology; Hem., Hemiptera; Hym., Hymenoptera; Icht., Ichthyology; Lep., Lepidoptera; Mam., Mammalia; Micr., Microscopy; Neur., Neuroptera; Orn., Ornithology; Orth., Orthoptera; Ool., Oology; Rep., Reptilia; Zoo., Zoology. * Signifies a Life Member.

EXTRACTS FROM MINUTES

(Ornithological communications included in the Epping Forest Diary (see pp. 37 to 43 are omitted here.)

January 7th.—Exhibits.—Mr. Burkill showed larvæ and burrows of an unidentified sawfly in twigs of *Salix fragilis* from Weybridge and Kew, and gave a short account of the spread of *Eriophyes triradiatus*—the mite stated to be the cause of the "witches brooms" on *Salix fragilis* and other species of willow—on the west side of London.

Paper.—Mr. A. Capleton read a paper entitled "Antlers," and illustrated with numerous drawings, and Messrs. Bacot, Robbins, Riches, and Ross took part in the discussion which followed.

February 4th.—Exhibits.—Mr. Russell James showed a series of very dark *Boarmia roboraria* from Ongar (1918), of which only a single specimen out of the large number seen was typical, and for comparison, eight typical specimens taken a few days earlier at Wyre Forest; also a box of specimens selected from a single night's captures at treacle near York, on 28th July, 1918, including long series of *Cosmia paleacea*, *Orthosia suspecta*, and *Cymatophora duplaris*, very dark *Xylophasia monoglypha*, *Aplecta occulta*, dark *Cleoceris viminalis*, *Epione parallelaria*, a small second-brood specimen of *Apamea basilinea*, and a dark-suffused reddish form of *Cosmia trapezina*. Mr. Sabine, a large number of Noctuæ collected in Co. Sligo in 1918, all in very fine condition and with many aberrations and considerable variation—*Plusia festucae*, *Aplecta herbida*, very large forms of *Acronycta euphorbiae* var. *myricae* (one being almost unicolourous blackish), fine forms of *Cirrhoedia xerampelina*, some with a unicolourous brownish ground and slightly darker central band edged with 2 conspicuous transverse yellow lines.

Mr. Shaw: a bred gynandrous *Amorpha populi* (left side ♂, right side ♀), and 2 hybrids of *Smerinthus ocellatus* ♂ and *A. populi* ♀.

Communications.—Mr. Bowman said that he and others collecting at Chingford has found *Cheimatobia brumata* particularly scarce during the past season.

New Member.—Mr. F. W. Blackburn, of Hastings, was elected.

March 4th.—Exhibits.—Mr. E. Aris, a series of *Bryophila perla* from Colchester, a specimen of *Arctia caia* with the left forewing almost wholly suffused with brown, a *Venilia maculata* from the New Forest, with the markings forming a band.

Communications.—Mr. Robbins recorded Snipe at Itchingwood, Limpsfield, on 24rd February.

Paper.—Mr. C. J. Burkill read a paper on "Galls caused by Sawflies," giving short descriptions of the various galls and the larvæ found in them, with the names of the different host-plants on which these galls occur in Britain and on the Continent. Messrs. Bacot, Hall, Riches, and Ross took part in the ensuing discussion.

April 1st.—Exhibits.—Mr. Ross showed a most interesting set of lantern slides of galls, chiefly those found on the oak.

Communication.—Mr. Hanson recorded the Tawny Owl in Winchmore Hill Wood on the 30th March.

May 6th.—Exhibit.—Mr. Riches, larvæ of *Apamea ophiogramma* in the stems of Ribbon Grass from Hornsey Rise. Dr. Cockayne, the bumble bee, *Bombus lapponicus*, with its mimic *Oedimagena tarandi* (a dipterous parasite of the Reindeer) from Yukanski, on the Murman coast of Russian Lapland near the entrance to the White Sea. They were taken in July and August, 1918, and although the *Bombus* was common only 6 specimens of the dipteron were seen.

Communication.—Mr. Burkill heard the Cuckoo on the 25th April at Roehampton.

Paper.—Messrs. Bishop, Bowman and Hall gave accounts of the "Oak and its Insects" from the botanical, entomological, and cecidological standpoints.

Mr. Bishop opened with a brief introductory address upon the British Oaks, emphasising the specific difference between *Quercus pedunculata* and *Q. sessiliflora*, and stating that in his experience the latter species was less liable to attack by lepidopterous and saw-fly larvæ and gall-insects. Possibly the stellate hairs on the underside of leaf of *Q. sessiliflora* may be some protection. These two species, or subspecies, are the only indigenous British Oaks, but there are two others which are now well naturalised in South Britain—*Q. cerris* (Turkey Oak) and *Q. ilex* (Holm or Evergreen Crab). Both of these are practically immune from larvæ attack, and in a wood where *Q. cerris* has been introduced the most casual observer in late May or June cannot help noticing that whilst larvæ of *Tortrix viridana* have made leafless skeletons of *Q. pedunculata*, they have left untouched the glossy-leaved *Q. cerris*.

Quite contrary to popular belief on the subject, the mistletoe is a very rare parasite on oaks, there being about a dozen authentic records in Britain, seven of which are in Herefordshire. No special mention seems to have been made in most cases as to the actual species which has been the host-plant. Miss Roper has recorded this parasite upon *Q. pedunculata* and *Q. sessiliflora* in Leigh Woods, North Somerset, and the only Surrey example (at Bunningfold) is upon *Q. pedunculata*. Mr. Bishop stated that he had been informed that pigs would not eat the acorns which fell from this particular tree, but he could not vouch for the truth of this.

Mr. Bowman said: "In dealing with the insects whose larvæ feed on oak, I find that the list is so extensive that it would take up more time than can be conveniently spared this evening to deal adequately

with it. I, therefore, propose to confine myself to the insects which are to be found in one of the most important localities within the confines of the Society, namely, Epping Forest.

Of the larvæ that I shall mention, some are to be found on oak only, some are often found on oak and sometimes also on other food-plants, whereas others are only occasionally found on oak. It would, however, serve no useful purpose to attempt to subdivide them in this manner, so I shall take the opportunity of calling your attention to some cases of interest.

Many larvæ feed on the oak in the true sense of the word, eating the leaves as they move from twig to twig, but it cannot be said that they all behave in this manner. In their early stages some species are gregarious, building a large webbed enclosure which forms their habitat, until, at a certain stage, they disperse and move about singly. Whilst occupying this webbed habitation the young larvæ find their way to the leaves in the immediate vicinity, but always return to the web, which temporarily forms their "Sanctum Sanctorum."

Other larvæ, from the time that they emerge from the ova, live between leaves, which they spin together, devouring the inner surface of the leaves and, as soon as these leaves are finished with, spinning others together. There are other larvæ that do not devour the leaves at all but feed on the wood underneath the bark and in the centre of the trunk.

Larvæ may be found on the oak at all times of the year; for even during the winter months, when the oak is devoid of leaves, some larvæ are to be found passing the winter, or what is usually termed "hibernating," on the twigs in a more or less dormant condition, and do not begin feeding again until the early buds appear in the spring.

I will now proceed to name some of the species which are associated with oak.

Among the butterflies, there is only one to be mentioned, *viz.*, *Thecla quercus*. I beat a number of the larvæ locally in the year 1910, and have since beaten odd ones. By locally, I, of course, imply Epping Forest.

Among the "clear-wings," also, there is only one, *viz.*, *Sesia cynipiformis*, the larvæ of which are to be found in oak stumps just under the bark.

I have just spoken of *Thecla quercus* and *Sesia cynipiformis* as being the only representatives among the butterflies and the clearwings. This applies not only to Epping Forest but to any part of the United Kingdom.

Among the Bombyces there are *Hylophila prasinana* and *H. bicolorana*, *Cossus ligniperda*, *Nola confusalis*, *Porthesia similis*, *Dasychira pudibunda*, *Orgyia antiqua*, *Pœcilocampa populi*, *Drepana falcataria*, *D. binaria* (*hamula*), *Stauropus fagi*, *Lophopteryx camelina*, *Notodonta chaonia*, *Phalera bucephala* and *Asphalia dilata*.

The larvæ of *Hylophila prasinana* and *H. bicolorana* both build a similar peculiarly shaped cocoon, which resembles an upturned boat.

The larvæ of *Cossus ligniperda* feed on the solid wood in the centre

of the tree, but there is no doubt that this larva finds oak wood too hard for its mandibles, and is consequently more often found in poplars and willows.

The larvæ of *Porthesia similis*, *Orgyia antiqua*, *Pœcilocampa populi*, and *Phalera bucephala* are gregarious in their early stages, whereas the larvæ of *A. diluta* pass their existence feeding between leaves. Most of you will no doubt associate the larvæ of *Phalera bucephala* with lime, but it is taken sparsely on oak.

Among the *Noctuæ* may be mentioned *Demas coryli*, *Acronycta aceris*, *Taniocampa gothica*, *T. incerta*, *T. stabilis*, *T. munda*, *T. pulverulenta*, *Anchocelis rufina*, *Cerastis rubricosa*, *Scopelosoma satellitia*, *Hoporina croceago*, *Dicycla oo*, *Calymnia trapezina*, *Hadena protea*, *Xylina ornithopus*, *Amphipyra pyramidea* and *Brephos parthenias*.

Of these *Demas coryli* and *Acronycta aceris* are, I believe, very seldom beaten out of oak, the former being most often found on beech and the latter on sycamore; also *Brephos parthenias* is more often associated with birch.

The Geometræ form quite an important section of the list and the following may be mentioned:

Cleora lichenaria, *Boarmia repandata*, *Tephrosia crepuscularia*, *Phorodesma pustulata*, *Hemithea strigata*, *Cabera pusaria*, all the *Hibernias*, *Anisopteryx æscularia*, *Cheimatobia brumata*, *Oporabia dilutata*, and *Eupithecia abbreviata*.

Although I have taken the larvæ of *Selenia lunaria* and *Ennomos erosaria* in Epping Forest, I have found both species decidedly scarce. In beating for the larvæ of *Phorodesma pustulata* special precaution should be taken. The branches should, in the first place, only be tapped gently, and if there are any larvæ of *pustulata* they will let themselves down by a silken thread and may easily be seen. The larva covers itself with chips of dead leaves, which it attaches to its body by means of a glutinous substance and is easily overlooked.

Mr. Hall gave a short account of those galls on oak which are due to the action of the flies of the Hymenopterous family *Cynipidae*. He dealt briefly with the life-history of various species and more particularly with the alternation of generations which is so largely characteristic of this group of insects.

June 3rd.—The decease of Mr. G. A. Pibel was announced.

Exhibits.—Mr. Burkill, leaves of *Populus nigra* galled by *Pemphigus marsupialis* on the mid-rib and by an unascertained species of *Pemphigus* on the petiole; both from Surrey.

Communications.—Mr. Burkill stated that the willow twigs exhibited by him at the November meeting as being attacked by a sawfly had resulted in the breeding of *Euura atra* by the Rev. F. D. Morice. Mr. Bishop stated that the following plants were found around Thorpe and Chertsey on the occasion of the Archaeological extension to that district on May 17th, *viz.*, *Saxifraga granulata*,

Ophioglossum vulgatum, *Geranium pratense*, *Valerianella carinata* (perhaps a garden escape), *Hydrocharis morsus-ranae* and *Hottonia palustris*. He also said that *Calla palustris*, one of the so-called Arum Lilies, occupies about an acre of Wisley Pond whence it was first recorded at least 12 years ago and appears to be increasing.

September 2nd.—Mr. Bishop, herbarium specimens of the following plants found by Mrs. Wilde and himself in Teesdale in July: *Thalictrum alpinum*, *Draba incana*, *Potentilla fruticosa*, *Astrantia helleborifolius*, *Helianthemum canum* var. *rineale*, *Peucedanum ostruthium* and *Bartsia alpina*. Mr. H. B. Williams, a specimen of *Sesia sphegiformis* taken near Oxshott in May—a new record for the Society's district; abs. *extensa-conjuncta* Tutt, and *intermedia* Tutt, of *Rumicia phlaeas*, and 2 males of *Agriades coridon* with thorax yellow on the underside, from the Chilterns in August.

Communication.—Mr. H. H. Williams recorded the occurrence of a female specimen of *Grapta c-album* near Wendover, Bucks, in August, this species being usually confined to the western counties and Wales. Mr. Glegg recorded the Dartford Warbler in the Isle of Wight on May 8th.

Discussion.—Mr. Hall opened a discussion on "Heredity and Environment," in which Messrs. Bishop, Dell, Nicholson, and Roberts took part.

October 7th.—Exhibits.—Mr. H. B. Williams, series of Butterflies to illustrate his paper, including *Pieris brassicae*, *rapae* and *napi*, showing ♂ with and without discal spot, ♀ with dusky brown suffusion at base of forewings, and the form, chiefly ♀, with transverse band joining the spots on the anterior wings; *Dryas paphia* abs. *valeziua* and *suffusa*; *D. paphia* and *Grapta c-album* with light and dark undersides; series of British Satyridæ to show extremes of variation in spotting; *Loweia w-album* and its ab. *butlerowi*, *T. rubi* and its ab. *immaculata*; ten specimens each of *Loweia dorilis* and *Rumicia phlaeas* to illustrate the remarkable parallelism in variation; also series of Plebeiid "blues," upper and undersides; *Aglais urticae* ab. *ichnusa* and *Euchloë cardamines*. Mr. Riches, a specimen of *Deilephila euphorbiae* reared from a larva found in a trench at Arras by his son in 1918. Dr. Cockayne, *Colias edusa* and var. *helice* from Spain, and *Teracolus amata* and its pale female, illustrating Mendelian sex-limited inheritance; *Elymnias fraterna* ♀, mimic of *Danais plexippus* (both sexes), the ♂ being non-mimetic (Ceylon), also *E. casiphone*, both sexes with the model they respectively mimic, the Euplæine *Trepsichrois basilissa* (Java). Nearly all species of *Elymnias*, in both sexes or females only, mimic the distasteful species of their area. He remarked that great size and a curved costa characterise nearly all the non-distasteful *Papilios* of various groups found in the East Indies, for example, *Papilio demolion* (Java) and *P. pigoie* (Celebes), *P. polytes* var. *theseus* and *P. polytes* var. *pammon* (Celebes), *P. teredon* (Ceylon) and *P. milon*, *P. telephus* (Java) and its var. *celebensis*.

New Member.—Mr. V. W. L. Daniel and Mr. B. T. Lowne were elected.

Paper.—Mr. Harold B. Williams read a paper on "Parallelism in Variation in Butterflies" (printed in this volume pp. 13 to 17). The President and Messrs. Austin, Heath, Mera, Robbins and Tremayne took part in the ensuing discussion.

November 4th.—Exhibits.—Mr. H. B. Williams, *Polia chi* and var. *olivacea* reared from East Yorks ova : a spherical cocoon of *Saturnia pavonia* without the ordinary exit and containing parasites which had emerged from the pupa and died in the cocoon. Mr. Burkill, galls of *Pontania bridgemani* on *Salix fragilis* with puparia of the fly, *Dryophanta dirisa* on *Quercus pedunculata* with flies, *Andricus ostreus* on *Q. pedunculata*, *Trigonaspis renum* on *Q. pedunculata*, *Rhabdophaga nervorum* on *Salix purpurea*, believed to be new to England ; all from Derbyshire and Staffordshire.

Communication.—Mr. Ross mentioned that at a meeting earlier in the year attention was called to the absence of certain galls usually common on the oak in the Society's district, notably those of *Andricus curvator*, *Neuroterus baccarum* and *Biorrhiza pallida*. *Neuroterus tricolor*, which appears somewhat later than these, is quite as frequent as usual in the Chingford district of Epping Forest, but its alternate generation, *N. fumipennis*, seems rare this season, as are *N. lenticularis* and *numismatis*, whilst *N. laeviusculus* is less common than usual and *Andricus ostreus* is frequent, if not quite as common as usual. In N. Oxfordshire there seemed no shortage of *N. lenticularis*, *numismatis*, or *laeviusculus*.

Lecture.—Mr. R. P. Howgrave Graham delivered an interesting and instructive lecture on "Chaucer's Pilgrim's Way," copiously illustrated with lantern slides, maps, and prints from the Ellesmere MS. The lecture was of varied and exceptional interest, and Mr. Howgrave Graham was warmly thanked by the Society.

December 2nd.—Communications.—Mr. Ross recorded that he saw a bat flying about 1 p.m. at Chingford and another had been seen by Mr. Nicholson at Redhill about 1.45 on November 23rd ; Mr. Burkill also saw many about 4 p.m. on the same day at Cobham. Mr. Burkill recorded *Biorrhiza aptera* ovipositing on an oak bud about 5 feet from the ground, the day being very warm.

President's Address.—Dr. Cockayne chose for his subject "Wing Colour in Butterflies and Moths," and his address is printed in this volume on pp. 32 to 36.

PARALLELISM IN VARIATION IN BUTTERFLIES.

Read 7th October, 1919, by Harold B. Williams, LL.B., F.E.S.

This is a subject which, I fear, must be introduced with an apology. It is a fascinating one from many points of view, but I wish to shield myself in advance from those critics who, one supposes, may attack it as an instance of over-minuteness in the study of marking. Let me commence therefore by indicating some of the directions in which a study of this sort may be of value. *First*, I think it is of the greatest value to the student of phylogeny. Just as he is able, by examining the greater or less specialisation of an insect in its various stages, to determine its age as a species in relation to others, and by comparative work to determine the relative age and descent of groups (I avoid here the terms "family" and "genus" intentionally as neither conveys any exact meaning in this respect, and though "group" is even more vague in a sense, I hope to specify later the sense in which I use it, including at times only portions of genera, in others whole families or genera) so by a comparison of wing marking, to some extent in typical specific forms, but particularly in corresponding varieties, he is able to form an idea of the more primitive forms. *Second*, it is of value in determining specific relationships and *third*, it is of assistance in speculation as to the origin of markings. All these, I think, are truly scientific and useful objects, and premise (here we attack our supposititious critic on his own ground) an exact knowledge of particular marking, and of variation and its limits (even if it extend to only one spot).

Now there are three ways, I think, in which the study of this subject may usefully be approached. First, parallelism in variation of species, allied or otherwise. Second, in the two surfaces of the same species, and third, in forms of allied species varying in the direction of the wing marking of the typical form of each other.

First then let us take the cases in which allied species vary in similar manner and shortly discuss them, confining ourselves largely to the British Butterflies for convenience, and omitting altogether for want of time the interesting tropical cases of parallel mimetic variation.

I will endeavour to follow the ordinary sequence and take therefore the British Pierids—*brassicae*, *rapae*, *napi* first. In these I find the following forms of variation common to all three :—

♂ with or without discal spot on forewing.

Transverse band linking up the spots in ♀ (and rarely in ♂).

Suffusion of dark scales at base of wings.

It is to be noted the extreme forms are rarer in *brassicae* than in the others.

The discal spot on the forewings of the ♂ is largely seasonal in *Pieris rapae* and *P. napi*. In *P. brassicae*, as far as I can ascertain, it is

purely aberrational and rare. In *P. rapae* and *P. rapi*, one may say generally that the discal spot is characteristic of the second brood, noting that in English *P. napi* a faint spot is fairly common in spring examples, never so conspicuous as in the average summer specimens, and that in Irish examples these faint traces of a spot seem to be the rule, rather than the exception, and that the spot is even occasionally well-developed. In Ireland, however, the summer ♂ ♂ are frequently so much more extreme than English ones that even here there is practically no overlapping, and Irish ♂ ♂ exist with an inner marginal spot corresponding to that of the ♀, fairly well-developed. I exhibit specimens of all these forms to illustrate these remarks.

In *P. rapae* spring ♂ ♂ with discal spots do occasionally occur.

I have *P. brassicae* ♂ ♂ with discal spot, but only very faint and ill-developed.

The occurrence of a transverse band of suffused black scaling linking up the 2 spots of the ♀ occurs in all species and I exhibit specimens of each. The *P. brassicae* shown is not at all extreme. Specimens were in the collection of the late Mr. Harrison of Woodford with a complete dusky fascia right across the wing.

The suffusion of dark scales at the base of forewings is almost normal in *P. napi*, common in *P. rapae*, and rare in *P. brassicae*.

The parallelism in variation between *Euchloë cardamines* and its allies I have already referred to in my paper on that species. [See "Trans.," 1915, pp. 62 to 84.—Ed.] I will content myself here with noting the variation in size of the discal spot from a minute point to a conspicuous spot in, I think, all species, and the occurrence of a discal spot in the hindwing in *E. cardamines*, *E. euphenoides*, *Anthocharis tagis* var. *bellizina*.

Continuing the policy of confining this paper to reasonable limits by concentrating on British species, I pass over the genus *Colias*, which however tempts me to a lengthy digression on account of the number of orange species, with pale dimorphic forms of the ♀, as in our British *C. edusa* ab. *helice*.

The Argynnids give us numerous examples. *Brenthis selene* and *B. euphrosyne*, for example, both have forms with yellow, and with white ground colour (as also has *Argynnis aglaia*). Remarkably similar upperside aberrations with suffused and united spots also occur, and underside forms with the silver spots united are also found in both species.

In the larger Argynnids aberrations with united spots occur on remarkably parallel lines. The occurrence of forms of the ♀ similar to *Dryas paphia* ab. *valezina* I have not noticed, but suffused forms occur in *Argynnis aglaia* ♀, which it is suggested (Tutt, "Brit. Butts.," p. 290) is a parallel development to the *valezina* form of *D. paphia*. These are ab. *suffusa*, Tutt, but as very similar suffused forms occur in *D. paphia*, and also in *D. paphia* ab. *valezina*, one is at a loss to follow the reasoning of Tutt in this instance. The parallel variation is there, but has nothing to do with the *valezina* form, and one is inclined to regard these suffused forms as sex-limited aberrations confined to the

♀ rather than as dimorphic ♀ ♀. Whether or not the coloration of ab. *valezina* is also a sex-limited character is a question one must reserve for another time, merely noting that there are reasons for supposing that it is, and that the same applies to the pale ♀ ♀ of the Coliads.

In the Vanessids there are several examples of parallelism. Most striking are the extreme forms ab. *testudo* of *Eugonia polychloros*, ab. *ichnusoides* of *Aglais urticae* and the similar form of *Grapta c-album* of which Dr. Cockayne possesses the only example known to me. In all these forms the 3 normal costal blotches are united into one long stripe. These 3 species also show light and dark undersides to hindwings of remarkable similarity. *Pyrameis cardui* and *P. atalanta* have each a form (ab. *elymi* of *P. cardui*, and ab. *klemensiewiczi* of *P. atalanta*) which a comparison of the undersides show to be similar.

In the Satyrids the instances even among our British species are so numerous that a whole paper might well be devoted to them—in fact a most fascinating paper by the Rev. G. Wheeler on one aspect only of this has recently been published in the "Proceedings" of the South London Society. The fascination of this family lies in the fact that not only do the species of each genus vary in several directions on precisely similar lines, but the genera divide themselves into groups throughout which some form of variation is general, while other variations occur practically throughout the family. I propose to take the case of the occurrence of additional spots as an example for discussion. These occur in every British species, though in the case of the genus *Erebia*, and of *Hipparchia hyperanthus* it is difficult to fix on a form which one may take as typical in this respect. Extra spots occur: (1) above and slightly outside the apical eye spot; (2) directly below the apical eye spot; (3) in one or more of the three interneural spaces below it; (4) on the hindwings. Any of these forms may occur on upper, or under surface, though, of course, the two surfaces do not always normally correspond. To list the species in which each form of variation occurs would be of no value at the moment, and I will content myself with reference to certain forms which appear to me of outstanding interest.

Epinephele tithonus and *E. janira* (*jurtina*).

These two species vary on somewhat similar lines, particularly in the direction of excess spotting. *E. tithonus* normally has the apical eye-spot duplicated. The commonest aberration of *E. janira* in this direction reproduces this duplication. Both are prone to development of 2 extra spots on the forewings. Mr. Wheeler has recently pointed out ("Proc. South Lond. Ent. Soc.") that in the case of *E. tithonus* 2 extra spots are considerably more frequent than one. 2 extra spots are as common as one in *E. janira*, though extra spots are rarer in this species than in *tithonus*. Extra spotted forms of *janira*, it may be of interest to note, are common in the Belfast district, on the hills on the Antrim side of Belfast Lough.

When only one extra spot is present it is as often the lower as the upper in *janira*, as far as I am able to judge, more often the lower in

tithonus, as Mr. Wheeler has pointed out. Note here that the lower spot appears in a position where a large spot is normal in many *Satyridae*, *e.g.*, in Britain in *Satyrus semele*, which produces the upper spot (between the 2 normal ones) as a rare aberration. I exhibit an example.

In *Coenonympha pamphilus* the extra spot (apart from duplication of the apical eye-spot, which is not uncommon), is, when it occurs, almost invariably the lower. I have no example of the development of the upper extra spot in *C. pamphilus*, and know of only one.

The extra spot *above* the apical is a common form in *Pararge megaera*. I have a ♂ specimen (exhibited) which has also an extra spot on the first neural interspace below.

In the smaller butterflies (Lycænids especially) we find much of interest. In the Theclids the obsolescence of the "hair-streak" mark is a form of variation common to most species. I exhibit *Thecla rubi* and its ab. *immaculata*, and *Loweia w-album* and its ab. *butlerowi*, as examples.

Parallel series of 8 aberrations of *Loweia dorilis* and *Rumicia phloeas* which I exhibit are remarkably similar. I have seen nothing in *L. dorilis* corresponding to ab. *radiata*, Tutt of *R. phloeas*, but most of the ordinary forms of aberration of ground colour and marking are represented.

The "Blues," especially the Plebeiid genera, are well-known for the remarkable parallelism of their variation. In fact a collection was formed especially to illustrate this by the late Dr. Hodgson. I exhibit 2 series—uppersides of *Agriades coridon*, *A. thetis*, *Polyommatus icarus*, and *Plebeius argus*, and undersides of *A. coridon*, *P. icarus*, and *P. argus*. Much more extensive series, of course, could easily be arranged, but want of space prevents it in my exhibit. The series of ♀ uppersides is perhaps most interesting. I refrain from discussing these in detail as I wish to deal with the other branches of the subject shortly.

Parallelism in marking of the 2 surfaces of butterflies is not common. Particularly it must be noticed that aberrations even of an extreme nature of one surface in an individual frequently show the other surface normal. In *Rumicia phloeas* for example, obsolescence, increase or striation of the spots on one surface is only rarely accompanied by a similar phenomenon on the other. The striate upperside I exhibit has a normal underside, and the striate underside a normal upperside.

In *Aglais urticae* every marking of the upper surface is reproduced by a marking of similar shape (but different colour, of course) on the under surface except the 2 "twin-spots" which do not occur on the under surface. Presumably the *ichnusa* form is the older, these 2 spots being a receent development. I exhibit ab. *ichnusa*, from Salisbury Plain, with no trace of these spots on the upper surface. In the *Satyridae*, in the case of extra spotting, although exactly similar forms occur on both surfaces, the 2 surfaces of any given insect by no means invariably correspond.

Of species varying in the direction of the normal marking of allied

species we have not many pronounced examples. *Euchloë cardamines* has a form (ab. *flava*, Williams) with a bright yellow ground colour approaching that of *E. euphenoides*. It also has a form, of which I exhibit the only British example I know of, with traces of a dusky shade between the white and orange spaces, as in *E. euphenoides* (ab. *umbrosa*, Culot). This appears normally to be a Syrian form.

The Coliads must here be mentioned again, the pale ♀ ♀ showing variation in the direction of normally pale species.

Aberrations of *Gonepteryx rhamni* have been recorded with traces of orange suffusion as in *G. cleopatra*.

In the "Ent. Rec.," vol. xxi., Mr. T. Reuss describes *Aglais urticae* ab. *ioformis* and ab. *ioprotoformis*, in which the markings undergo a transition in the direction of those of *Vanessa io*. Forms of *V. io* tending in the direction of *A. urticae* also occur.

Many more examples might be collected among the *Satyridae* (*Erebia*) and *Lycaenidae*, but these would be of species normally very similar and in such cases it is difficult to separate such variation into categories showing variation of one species towards another, and variation of both in the direction of a presumed ancestral form.

I trust this paper will serve its real object, which is to stimulate a little thought on the subject sufficient to found a discussion.

ARCHAEOLOGICAL SECTION. REPORT FOR 1919.

The welcome return of Peace has enabled the Section to resume in some measure its usual activities.

Three excursions have been made during the year (*a*) to St. Giles's, Cripplegate, on 29th March, under the very competent guidance of Mr. Hopwood; (*b*) to Thorpe Church near Chertsey, on 17th May, and (*c*) a week-end excursion to Sherborne Minster, Dorset, on October 18th-20th.

Four meetings of the Section have been held at Salisbury House, *viz.*, on 18th March, 20th May, 16th September and 16th December.

At the meeting on 20th May Mr. E. B. Bishop read a paper on Archæological Rambles in the Cotswolds, and on 10th December Mr. Marshman Wattson gave a lantern lecture on the Stones of English History.

On 4th November, at the instance of the Section, Mr. R. P. Howgrave-Graham gave a lantern lecture on Chaucer's Pilgrims' Way to the whole Society.

The Record of the visit to St. Giles's, Cripplegate, has been placed in the library, and a record of the inspection of Thorpe Church is in course of preparation.

To the keen regret of the Section Mr. Marshman Wattson resigned the Recordership, and at a Committee Meeting on 4th September it was decided to ask Dr. W. Simpson to accept the office. Dr. Simpson has since expressed his willingness to act, provided he has the active support and assistance of the Section. An interesting series of suggestions for the compilation of Records has been framed by Dr. Simpson.

E. B. Bishop, *Chairman.*

REPORT OF BOTANICAL SECTION FOR 1919.

There is nothing of absorbing interest to report for the year just ended. We are glad to welcome back those members who, during the war, have been on active service, but owing to the necessarily slow process of demobilisation such members have not yet been able to render much assistance to the Section. To most of us the coming of peace, welcome as it has been, has resulted in greatly increased business strain and pressure, and consequently diminished opportunities for botanical work.

The Sectional Meetings have been only moderately well attended.

The Excursion to Leatherhead, on June 21st, was expanded into a week-end, the headquarters being the "Old Running Horse" Inn, Leatherhead. Nine members and friends made up the party, and a thoroughly successful and enjoyable time was spent- Several local and interesting plants were observed, the most noteworthy being *Cynoglossum montanum*, still growing freely in its old habitat, well within the Society's district.

The afternoon excursion to Harefield, Middlesex, on July 26th, though poorly attended, was a distinct success. Several of the local plants recorded by Trimen and Dyer still survive and flourish in this delightful corner of the metropolitan county.

The Society as a whole, and the Botanical Section in particular, has greatly benefited by the most valuable bequest of our lamented colleague, Mr. C. S. Nicholson. The excellent set of beautifully bound volumes of the "Journal of Botany" will be invaluable for research purposes, to which must be added the many volumes of Local Floras and other standard works. The Nicholson Herbarium bequest includes a mass of material to which much time and labour will have to be devoted before its full value can be adequately realised.

Several useful lists of plants found in the Society's district have been sent to the Recorder during the year, mostly for the Southern portion. Special thanks are due in this connection to the Rev. P. H. Cooke and Mr. L. J. Tremayne.

Sixty-nine new species have been added during the year to the records for the Southern portion, the most noteworthy being the following :—

Ranunculus sardous, Craitz.
Cochlearia anglica, L.
Cerastium arvense, L.
Pyrus torminalis, Ehrh.
Saxifraga granulata, D.
Aster Tripolium, L.
Anthemis nobilis, L.
Artemisia maritima, L.
Glaux maritima, L.
Anagallis foemina, Mill.
Cynoglossum montanum, L.
Verbascum lychnitis, L.
Lamium hybridum, Vill.
Plantago maritima, L.
Chenopodium urbicum, L.
Mercurialis annua, L.
Hydrocharis Morsus-ranae, L.
Convallaria majalis, L.
Lemna trisulca, L.
Triglochin maritimum, L.
Carex divisa, Huds.
Brachypodium pinnatum, Beauv.
Lastrea spinulosa, Presl.

Lists of plants from any part of the district, north and south, with exact localities, *stating the sub-district* and date of observation with specimens (other than those of the most common species) whenever possible will be much appreciated by the Recorder. Members of other Sections are specially asked to help in this manner.

R. W. Robbins, *Chairman.*
C. L. Wilde, *Secretary.*
January, 1920.

LEPIDOPTERA SECTION—REPORT FOR 1919.

The Section cannot yet claim to have restored the standard of this branch of the Society's work to that existing prior to the war, but the attendance at the meetings and the interest of exhibits have shown an improvement. The average attendance at Sectional meetings has been $7\frac{3}{4}$ as against $4\frac{1}{5}$ last year, and the average has shown a steady improvement throughout the year. There are still, however, many members who have not resumed attendance.

Eight meetings have been held at Salisbury House and two Field meetings.

Notable exhibits include :—

Sphinx ligustri with black central stripe on body and forewings suffused with chocolate.—Mr. R. T. Bowman.

Rumicia phloeas abs. *eleus* (Berkhamstead) and *obsoleta* (Limbr.), Dr. E. A. Cockayne ; abs. *alba* (Teignmouth and Missenden), *intermedia*, *obsoleta*, *radiata*, *suffusa*, *eleus*, *infra-extensa*, *infra-radiata*, *extensa-conjuncta*, *remota*, etc., Mr. H. B. Williams, abs. *suffusa* and *intermedia*, Mr. C. H. Williams ; abs. *radiata* (Finchley), *obsoleta* (Darenth), *suffusa* (Bexley), Mr. V. E. Shaw.

Xanthia ocellaris and abs. *gilvescens* and *intermedia*, Mr. H. W. Wood.

Agriades coridon, a leaden male, Mr. C. H. Williams.

Anaitis plagiata, an extreme melanic form, and *Acronycta menyanthidis* with dark border to forewings (both from Dumbartonshire), Dr. E. A. Cockayne on behalf of Mr. R. Horn, of Glasgow.

A very successful exhibition of living autumn larvæ was held on September 16th.

One species, *Sesia sphegiformis*, has been added to the list of Lepidoptera occurring in the Society's district.

E. A. Cockayne, *Chairman.*
Harold B. Williams, *Secretary.*
November 18th, 1919.

REPORT OF THE ORNITHOLOGICAL SECTION FOR 1919.

1. During the year the Section was glad to welcome back on demobilization, Messrs. Glegg, Bayne and Collenette, the latter, unfortunately, shortly afterwards having to return to the East to resume his duties there. The number of members belonging to the Section is now upwards of thirty, of whom, however, only about a third are active. The officials for the ensuing year elected at the Annual Meeting of the Section, held on November 18th last, are as follow :—Mr. W. E. Glegg, Chairman ; Mr. S. Austin, Secretary ; Mr. A. Brown, Recorder ; together with Mr. P. J. Hanson. The thanks of the Section are due to Mr. L. J. Tremayne for undertaking the work of recording during the past two years.

2. The Committee of the Section arranged for a Paper for the Syllabus, *viz.* : on April 15th, by Mr. J. E. S. Dallas, entitled "Bird Notes from South-East England." Four meetings of the Section have been held, at three of which Papers were read, *viz.* :—On June 17th, by Mr. A. Capleton, on the "Motions and Attitudes of British Birds on the ground" ; on October 21st, by Mr. H. C. Playne, M.A., on "Some Problems suggested by the Song of Birds" ; and on November 18th, by Mr. P. W. Horn, on "Notes on the Young of some British Birds." Three Field Meetings were held as follows :—On May 25th, conducted by Mr. J. E. S. Dallas, to the district round Warlingham ; on July 5th, conducted by Miss G. M. Towsey, to Petersham Park, Ham Common and Richmond Park ; and on November 30th, conducted by Mr. S. Austin, to Canvey Island. In addition six meetings of the Committee were held. A Paper was also read before the Chingford Branch, on October 13th, by Mr. A. G. Hubbard, B.Sc.,

on "British Birds' Nests." The Section would like to place on record its appreciation of the work of our old member, Captain Oliver G. Pike, R.A.F., in discovering and photographing the breeding place in Hertfordshire of the Black-necked Grebe (*vide* "British Birds," November, 1919), and to welcome him back to the Society.

3. The Report on the Birds of Epping Forest has been continued and is printed elsewhere in the Transactions. Attention is drawn to the new form in which these notes will appear in future. Records from members, and others, will be welcomed.

4. The Society's local district map, referred to in paragraph 6 of last year's Report, has now been printed and placed on sale at 6d. per copy. All members of the Society are urged to obtain a copy.

5. Thirty-two birds have been ringed during the year under the "British Birds" Marking Scheme. Two recoveries have been reported, *viz.* :—Song Thrush, ringed at Woodford Green, Essex, on May 7th, 1919, recovered at same place on June 6th, 1919 (bird found dead); and Redbreast, ringed at Woodford Green, Essex, on March 4th, 1919, recovered at Woodford Wells, Essex, on April 6th, 1919. It is hoped that this important branch of the Society's activities will be more in evidence in future.

6. The collection of photographs of birds and nests has been increased by the addition of a number of Mr. P. J. Hanson's photographs.

9. The total numbers of different species of birds and nests, recorded in the various sub-divisions, since the scheme was started, up to the end of 1919, are as follows :—

Northern District.

		Birds.	Nests.
No. 1.	Colnbrook	44 ...	5
2.	Rickmansworth ...	65 ...	30
3.	Hounslow	71 ...	12
4.	Harrow	80 ...	33
5.	Mimms	41 ...	10
6.	Hampstead	108 ...	46
7.	Enfield Chase ...	95 ...	35
8.	Lea Valley	116 ...	42
9.	Epping	126 ...	78
10.	Hainault	68 ...	52
11.	Brentwood	75 ...	46
12.	Rainham	57 ...	49

Southern District.

		Birds.	Nests.
1.	Weybridge	7 ...	2
2.	Wimbledon	62 ...	5
3.	Chessington	17 ...	3
4.	Norwood	18 ...	—
5.	Banstead	32 ...	2
6.	Caterham	42 ...	15

Southern District—contd.	Birds.	Nests.
7. Holmesdale ...	... 41 ...	2
8. Blackheath ...	... 38 ...	4
9. Kent Marshes	... 1 ...	—
10. Darenth ...	... 5 ...	2
11. North Downs	... 13 ...	—
12. Westerham ...	... 6 ...	1

For the Northern district, twenty-four new records and nine new nesting records have been entered for the various sub-districts during the past year; and for the Southern district, twelve new records and twelve new nesting records have been so entered for the same period.

8. Five species new to our district have been recorded, making the total number 157. These new occurrences are :—*Anthus petrosus* (Rock Pipit), at Grays, Essex, probably in 1908, recorded by Mr. P. W. Horn (per S.A.); *Phoenicurus titys* (Black Redstart), ♀ at Thornton Heath, Surrey, October 21st, 1910, recorded by Mr. P. W. Horn (per S.A.); *Oenanthe oe. leucorrhoa* (Greenland Wheatear), Grays, Essex, September, 1907 (skin in possession of Stepney Museum and identified by Mr. F. J. Stubbs in 1909), recorded by Mr. P. W. Horn (per S.A.); *Spatula clypeata* (Shoveller), three on Birch Hall Pond, Theydon Bois, Essex, April 20th, 1919, recorded by Mr. F. J. Stubbs (per S.A.); *Larus marinus* (Great Black-backed Gull), two on the Roding, near Ilford, April 29th, 1918, recorded by Mr. C. Murray.

9. Other interesting records are as follows:—*Corrus cornix* (Hooded Crow), Fairmead Bottom, Epping Forest, November 2nd, 1919, reported by Mr. W. E. Glegg, and West Thurrock, December 9th, 1919, reported by Mr. P. W. Horn (per S.A); *Pica pica* (Magpie), pair seen near High Beach, Epping Forest, August, 1918, reported by Miss A. Hibbert-Ware (per A.B.); *Passer montanus* (Tree Sparrow), Chingford Plain, July 20th, 1919 (W.E.G.), Whitehall Plain, October 5th, 1919, (J.R.); *Fringilla montifringilla* (Brambling), Warlingham, January 5th and 19th, 1919, Kew, January 9th, 1919, reported by Mr. J. E. S. Dallas (per S.A,), Debden Slade, Epping Forest, April 3rd and 8th, 1919, reported by Mr. P. D. Hayward (per S.A.), and Dagenham Lake, October 5th, 1919, reported by Mr. P. W. Horn (per S.A.): *Acanthis linaria cabaret* (Lesser Redpoll), Finsbury Park, London, "saw and heard a pair on June 8th, 1919; on July 20th again saw a pair and from their behaviour came to the conclusion that they had nested in the park," reported by Mr. R. Hay Fenton (per S.A.); *Emberiza calandra* (Corn Bunting), Chelsham, Surrey, in song, February 16th, 1919, reported by Mr. J. E. S. Dallas (per S.A.); *Saxicola rubicola* (Stonechat), High Beach, Epping Forest, March 28th, 1911, September 15th, 1913, March 17th, 1914, and September 24th, 1914, Fairmead Bottom, Epping Forest. September 20th, 1912, and September 26th, 1913, reported by Mr. P. D. Hayward (per S.A.); *Lanius excubitor* (Great Grey Shrike) Warren Plain, Epping Forest, December 25th, 1919, reported by Mr. W. E. Glegg—"The bird had perched in characteristic Shrike manner on the topmost twig of a tree. After settling on the highest point of another tree, the Shrike disappeared

into the private grounds of the Warren " (see " British Birds," p. 146, November, 1919, and " Essex Naturalist," page 142, Part II., volume xix.) ; *Oenanthe oenanthe* (Wheatear), Warren Hill, Epping Forest, August 14th, 1912, High Beach, Epping Forest, September 9th and 19th, 1913, and April 15th, 1915, reported by Mr. P. D. Hayward (per S.A.), Whipp's Cross, Walthamstow, April 18th, 1919, reported by Miss A. Hibbert-Ware (per A.B.), Ilford, May 6th, 1919, reported by Mr. C. Murray ; *Alcedo ispida* (Kingfisher), near Staples Hill, Epping Forest, nested and brought off young, June 14th, 1915, reported by Mr. P. D. Hayward (per S.A.) ; near Woodford Green, nested and brought off young, May, 1919, reported by Mr. H. C. Playne, (per S.A.) ; *Carine noctua* (Little Owl), between Higham's Park and Chingford, July 20th, 1919, reported by Mr. W. E. Glegg, Enfield, July 18th, 1919, reported by Mr. P. J. Hanson ; *Buteo buteo* (Buzzard), Ilford, June 11th and November 25th, 1919, reported by Mr. C. Murray ; *Scolopax rusticola* (Woodcock), near " Robin Hood," Epping Forest, October, 1919, reported by Mr. P. D. Hayward (per S.A.) ; *Tringa alpina* (Dunlin), West Thurrock, Essex, December 18th, 1919, reported by Mr. P. W. Horn (per S.A.) ; *Totanus hypoleucus* (Common Sandpiper), Connaught Water, Epping Forest, May, 1917, reported by Mr. P. D. Hayward (per S.A.), River Roding, near Ilford, May 21st and September 3rd, 1919, reported by Mr. C. Murray, New River, Bush Hill Park, September 7th, 1919, reported by Mr. P. J. Hanson ; *Charadrius apricarius* (Golden Plover), in considerable numbers by River Roding, near Woodford, February 1st, 1919, reported by Mr. H. C. Playne (per S.A.), River Roding at Theydon, February 15th, 1919, reported by Mr. L. J. Tremayne.

10. The thanks of the Section are due to those members of the Society who have assisted it in its work, and also to the following friends, to whom it is indebted for many interesting records and notes, *viz.* :—The Misses A. Hibbert-Ware and G. M. Towsey, and Messrs. J. E. S. Dallas, R. Hay Fenton, P. W. Hayward, H. C. Playne, F. J. Stubbs, W. F. Stevens, and T. M. Blagg.

For the Ornithological Section,

A. Brown, *Secretary*,
December 31st, 1919.

EXTRACTS FROM MINUTES OF ORNITHOLOGICAL SECTION.

April 15th, 1920.—Paper.—Mr. J. E. S. Dallas read " Bird Notes from South-East England," illustrated with lantern slides. The districts treated of were Dungeness and Warlingham, and a number of interesting species were referred to from both localities. A slide of the nest of the Common Tern showed pieces of wood arranged about the nest, and the lecturer stated that this was frequently found to be the case. He suggested that they might serve as identification marks for the nesting birds. A very fine photograph of the Little Owl was shown and a description given of the love flights of the Nightjar.

May 25th, 1919.—Field Meeting.—Warlingham, Surrey. Leader, Mr. J. E. S. Dallas. 32 species were identified. Nests found ; Yellow Bunting, 3 eggs ; Tree Pipit, 3 nests, 5, 6 and 2 eggs

respectively ; Wryneck, nesting hole found ; Nightjar, 2 eggs ; Little Owl, nest with empty egg-shell.

June, 17th, 1919.—Paper.—Mr. A. Capleton read a paper on "The Motions and Attitudes of British Birds on the Ground." The lecturer divided his paper into three parts. (1) Those birds frequently seen on the ground and obtaining the whole or a part of their food there. (2) Birds obtaining only a part of their food from the ground and only occasionally to be seen there ; and (3) Birds rarely, if ever, seen on the ground. Mr. Capleton gave a detailed account of various species of birds and their actions arranged under these three headings.

July 5th, 1919.—Field Meeting.—Richmond and Petersham Park and Ham Common. Leader, Miss G. M. Towsey. Thirty species were identified, among the more interesting being Whinchats and Great Crested Grebe in Richmond Park, Red-backed Strike on Ham Common, and Nuthatch heard frequently in Petersham Park.

October 21st, 1919.—Communications.—Mr. Glegg reported that in company with other members of the Section, and under the guidance of Mr. O. G. Pike, he had recently had the opportunity of observing the Black-necked Grebe in Hertfordshire. Mr. Hanson, who had also seen this species, remarked that the most striking feature of the bird was its red eye. He also reported the Grasshopper Warbler at Tring, and stated that Martins were still to be seen at Bush Hill Park, Enfield, on October 7th last. Mr. Dallas stated that the Magpie had increased recently in the Warlingham district.

Paper.—Mr. H. C. Playne, M.A., gave an address on "Some Problems suggested by the Song of Birds." A diagram of the vocal apparatus of a bird was shown, and the mechanism explained, and the lecturer stated that bird song could not be expressed by musical notation. Some of the problems to be solved were—How do birds learn their song? Do our migrant birds sing in the lands from which they come ? Are there any reasons for song ? Is song stimulated by anger or excitement ? One of the most moving things in connection with bird song was the early morning chorus which went all round the world just in front of sunrise. A vigorous discussion followed.

December 18th, 1919.—Communications.—Mr. P. W. Horn, Curator of the Stepney Borough Museum, reported a Chiffchaff singing in St. George's Recreation Ground, Stepney, on September 17th.

Exhibits.—Mr. Horn showed a small interesting collection of bird skins, some of which were from the Society's local district, viz., Common Crossbill, Keston, Kent ; Black Redstart, Thornton Heath, Surrey ; Greenland Wheatear, West Thurrock, Essex ; Greenshank, Ribbleside, Essex.

Paper.—Mr. Horn communicated some original and extremely interesting "Notes on the Young of some British Birds," in which he

narrated his experiences in rearing the young of a number of species and describing the method of feeding, etc., adopted. The characters of various nestlings were described, and amongst other subjects dealt with were alarm notes and song, mimicry and instinct.

November 30th, 1919.—Field Meeting.—Canvey Island, Essex. Leader, Mr. S. Austin. Thirty-two species were identified, the Ringed Plover, Golden Plover, and Curlew being the most interesting of those observed.

REPORT OF PLANT GALL SECTION, 1919.

Two Papers were contributed to the Society during the year, *viz.* :— On March 4th on "Sawfly Galls," by Mr. H. J. Burkill; and on May 6th on "Oak Galls," by Mr. L. B. Hall.

A fair amount of work seems to have been done by the various members of this Section, but up to the time of writing these members seem to have been unable to compile the results of their observations so that most of the details have necessarily to be held over for the present.

Some of the members joined in expeditions with other Sections, in this way combining Archaeology or Botany with their own special subject. The early summer outings to Thorpe, Surrey, and Epping Forest showed that there was a great scarcity of the spring forms of Oak Galls, the only plentiful species in Epping Forest being *Spathegaster Aprilinus*. Flies thought to be of this species were observed ovipositing in the mid-ribs and lateral veins on the underside of Oak leaves.

This scarcity of species has been continued in the corresponding forms in the Autumn, and a good deal of material has been collected for comparison with observations in the coming year.

Andricus curvator, Hartig. Remains of a few seen near Oxshott, November; also in Derbyshire and Staffordshire, October. No fresh ones seen in early summer on west or south-west side of London.

A. curvator, form *collaris*, Hartig. Remains seen in winter on Wimbledon Common.

A. gemmatus, Adler. Dead galls plentiful on one tree on Putney Heath in winter; also seen in Kingston Vale.

A. gemmatus, form *corticis*, Linn. No fresh ones seen near London one group of cells noted in Derbyshire.

A. inflator, Hartig. Dead ones noticed on Wimbledon Common in winter.

A. inflator, form *globuli*, Hartig. Not noticed.

A. trilineatus, Hartig. One twig with old galls, Wimbledon Common, in the winter.

A. trilineatus, form *radicis*. Fbr. Not seen, though searched carefully for where it used to be frequent on Wimbledon Common.

A. pilosus, form *fecundator*, Hartig. A few on Weybridge Heath.

Biorrhiza pallida, Oliv. Only one fresh one seen, near Hounslow;

a few old ones noted during the winter on Wimbledon Common, Esher Common, and Weybridge Heath.

B. pallida, form *aptera*, Bosc. Wimbledon Common, a few. Failed to find it in its old haunts in Richmond Park.

Trigonaspis megaptera, form *renum*, Hartig. Two lots found near Stanton, Staffs. Not seen elsewhere.

Neuroterus albipes, form *laeviusculus*, Schrnk. One good colony on Wimbledon Common. A few found in Derbyshire.

N. baccarum, Linn. Not noticed on the west or south-west of London during the spring. Was also very scarce the previous year.

N. baccarum, form *lenticularis*, Oliv. A few on Weybridge Heath and in Derbyshire. Several trees attacked near Stanton, Staffs.

N. tricolor, form *fumipennis*, Hartig. A few in Dovedale, Derbyshire, fairly frequent near Stanton, Staffs. A few on Weybridge Heath.

N. resicator, Schl. A few old ones noted in the Autumn on Weybridge Heath, and one record from Wimbledon Common.

N. resicator, form *numismatis*, Oliv. A few, Wimbledon Common, Weybridge Heath, and Derbyshire. Several leaves attacked near Stanton, Staffs.

Dryophanta dirisa, Hartig. Stanton, Staffs., plentiful. Could not find this species, or *longirentris* or *folii* where they used to be frequent on Wimbledon Common.

Neuroterus Aprilinus, Girand. Plentiful in Epping Forest, May 25th ; flies had emerged and the galled buds were mostly "spotted" owing to the exit holes. Some flies were seen ovipositing in the veins on the underside of the oak leaves.

Neuroterus ostreus, Girand. Plentiful on Weybridge Heath. Also seen, Wimbledon Common, Walton on the Hill, Oxshott, and Derbyshire, but not as plentiful in the last named as it was in 1914.

Andricus solitarius, Fousc. Weybridge Heath, November.

A. albopunctatus, Sch. Several galls on the usual tree beyond Bedfont, June. A few in Epping Forest.

Cynips Kollari, Hartig. Generally distributed.

Callirhytis glandium, Girand. Kew Gardens, several galled acorns under one tree.

The various species of Oak Galls that are not mentioned above have not been observed during the year.

Pemphigus galls were common on *Populus nigra* in Epping Forest and near Teddington on 25th and 31st May respectively, and the early appearance of the spirally-twisted petiole gall has caused the opinion to be expressed that the species is *P. protospirae*, Licht., and not *P. spirothecae*, Pass., as the latter is autumnal. It is to be hoped that this point will be settled this year as the early species does not seem to have been hitherto recorded as British.

Eriophyes triradiatus, Nal., continues to spread rapidly round London, especially on the western side.

Rhabdophaga nerrorum, Keiff., was recorded from Derbyshire (H.J.B.) in October on *Salix purpurea*, Linn. A fresh host plant record for Britain.

Urophora solstitialis, Linn., was recorded on *Centaurea scabiosa*, Linn., by Mr. Tremayne, from Surrey and Somerset, which appears to be a fresh host plant record for Britain.

The gall recorded by Mr. L. B. Hall (Houard, No. 7372) as occurring on *Galium Mollugo*, Linn., in West Sussex, 1918, was found to be well established on *G. verum*, Linn., in the neighbourhood of Leatherhead and Box Hill on June 21st. *Eriophyes ilicis*, Can., on *Quercus Ilex*, Linn., *E. convolvens*, Linn. and *Gymnosporangium clavariaeforme*, Jacq., were also recorded the same day from near Leatherhead, while later on in the afternoon *Oligotrophus Leemei*, Keiff., was found on *Ulmus glabra*, Huds., near Mickleham. It was reported in September from Staffordshire (H.J.B.) on the same species.

The Sawfly—*Euura atra*—whose larvæ live in the pith of willow stems and may cause a slight swelling in the thinner twigs, though hardly enough to be classed as a gall, was found in large numbers on *Salix fragilis* on the Surrey bank of the river from Kew Bridge to Hammersmith Bridge, and was kindly identified by Rev. F. D. Morice.

CHINGFORD BRANCH—REPORT FOR 1919.

The interest in the Branch has been well maintained and, in order to increase its activities, it was decided, at the last meeting in the year, to form a local committee.

The largest attendance at the meetings was 35 and the smallest 15 ; the average being about 25.

Papers or lectures were given as follows:—"Some Aspects of Migration," by J. F. Stubbs ; "The Colours of Flowers," by R. W. Robbins ; "Notes on a Naturalist's voyage round the world," and "Snakes and Lizards," by E. Samuelson ; "Some Oak Galls," by J. Ross ; "British Birds Nests," by A. G. Hubbard, B.Sc.; "Wayside Notes," by L. B. Hall.

The Branch also had two Microscope evenings, an innovation which was much appreciated. They unfortunately lost the services of their excellent chairman, Canon Russell, who has left the neighbourhood, but his place has been taken by Mr. A. G. Hubbard, B.Sc. The Local Secretary is E. Samuelson, 39, The Ridgeway, Chingford. E. 4.

COUNCIL'S REPORT FOR 1919.

(Presented at the Annual Meeting, 2nd December.)

Though a year has elapsed since hostilities ceased, the period since our last Annual Meeting has been a difficult one for the Society, and your Council again appeals for the cordial support of all members to increase interest in the meetings and also to enlarge the Society's membership. It is with much pleasure that we have welcomed back those of our members who have been on service, and it is satisfactory to note that many of them have resumed an active part in the work of the Society. Over four years of war have been a severe test of the loyalty of our members, but the trial has been faced, and though we have to confess that the Society has been weakened in membership we may confidently say that a recovery has commenced, and that we hope soon to see the several branches of our work favourably progressing. We have, however, to leave our convenient quarters here at Salisbury House, but fortunately we have been able to find accommodation at Winchester House, Broad Street. We shall have to pay a higher rent at Winchester House and as the finances of the Society are not robust the question of an increased subscription may have to be faced. It is a possibility also that we may have to curtail the number of Sectional Meetings that we can hold. Your Council would take this opportunity of recording to the owners and officials of Salisbury House its warm appreciation for the generous and courteous treatment given to the Society.

The reorganisation that has been and is yet necessary to get the Society into full working order has taken much of the time available for Council Meetings, and important proposals for the re-constitution of the Council in order to give Sections direct representation on that body and to keep officers of Sections in close touch with the Council have been but partly considered.

Early in the year Mr. Ross, who had been one of the Society's Secretaries since its formation, had to resign through business pressure and indifferent health, and after some difficulty a successor was found in Mr. Vernon Stuart. The Council desires to place on record its appreciation of the inestimable services rendered to the Society by Mr. Ross. It would not be easy to find words to adequately express the value of his work.

The List of Officers nominated for election to-night will show that we are losing the services of Dr. Cockayne as President. That Dr. Cockayne for five troubled years has been our head gives cause for thankfulness, for his scientific attainments and sound guidance in critical situations have been a great asset to the Society, as those in touch with him thoroughly appreciate.

The difficulties of the Society are by no means overcome, but

having survived the war years we hope for an era of increased membership and for renewed enthusiasm to give us opportunities of realising the hopes formed at the time of the amalgamation in 1914.

The Council appeals to members who may have unwanted copies of the 1915 vol. of Transactions to present such copies to the Society, as the stock of that year's issue has become exhausted.

THE LONDON NATURAL HISTORY SOCIETY.

TREASURER'S ACCOUNTS FOR THE YEAR 1919.

GENERAL ACCOUNT.

1919	£	s.	d.		£	s.	d.
By Subscriptions in advance	1	17	6	To 1918 Balance	3	8	2
,, ,, in arrear	11	18	0	,, 1919 Postages	4	1	4
,, ,, and entrance fees	36	8	6	,, Lepidoptera Section expenses	0	1	5½
,, Interest on Deposit	0	5	7	,, Gratuity	0	10	0
,, ,, ,, Exchequer Bonds..	0	18	0	,, Subscriptions	1	5	6
,, Librarian's Sales	0	8	6	,, Printing	8	11	6
,, Cash in Secretary's hands	0	15	0½	,, Rent (Salisbury House)	21	0	0
				,, Insurance	0	10	3
				,, Sundry expenses	2	13	1
				,, Chingford Branch expenses	2	13	6
					44	14	9½
				,, Balance	7	16	4
	£52	11	1½		£52	11	1½

LIFE COMPOSITION ACCOUNT.

	£	s.	d.	1919	£	s.	d.
By 1918 Balance	15	0	0	To Interest to General Account	0	18	0
,, 1919 Interest on Exchequer Bonds	0	18	0	,, Balance	15	0	0
	£15	18	0		£15	18	0

PUBLICATION ACCOUNT.

1919	£	s.	d.		£	s.	d.
By Donations	16	1	0	To Balance, 1918	6	0	1
,, Copies of Transactions..	4	3	3	,, Expenses	0	18	
,, Advertisements	1	0	0	,, Archer & Co. (Printing)	25	4	6
	21	4	3				
,, Balance	10	18	10				
	£32	3	1		£32	3	1

CABINET ACCOUNT.

	£	s.	d.
By 1918 Balance	2	17	6
,, Donation	0	7	5½
Balance to 1920..	3	4	11½

Audited and found correct:
LEWIS EYNON
J. ROSS
Hon. Auditors.

F. G. DELL,
Hon. Treasurer.

WING COLOUR IN BUTTERFLIES AND MOTHS.

(Read at the Annual Meeting, December 2nd.)

The Theoy of Natural Selection put forward by Darwin and Wallace more than half a century ago, and amplified by their successors, explained the meaning of so much that was formerly obscure in the wing colouring and pattern of the Lepidoptera, that for a long time it was accepted by the majority of naturalists as a complete and final explanation.

The object of my address to-night is to show that in some respects it is incomplete and unsatisfactory. I think no one doubts that the underside colour and pattern of all our native butterflies and of those moths which rest with wings opposed in butterfly fashion, such as *Selenia* and *Bupalus*, are coloured to resemble their surroundings and to obtain protection against their enemies. Protective resemblance is also provided by the upperside colour of all four wings in those moths which sit in exposed situations with wings outspread such as the *Boarmidae* and *Eupithecidae*.

In those in which the uppersides of the forewings only are exposed in the resting position, such as most *Noctuidae*, these are protectiwely coloured, and the hindwings have a dull colour with little or no pattern in the majority of cases.

Most of the butterflies on the contrary have a bright and conspicuous colour scheme on the upperside. It is this whlch it is so difficult to explain satisfactorily.

Observation has proved that butterflies, when they are on the wing, are comparatively immune to the attacks of birds. This observation applies almost equally to the butterflies of both temperate and tropical regions, although a few birds do habitually prey on them at such a time.

Birds are the only possible enemies (common to all regions) of importance to a butterfly flying in the open. Therefore it might be argued that since they are so seldom attacked when their upperside is exposed the colour and pattern displayed is in no way protective, but has developed unmodified by the action of natural selection. Apart from the fact that it is difficult to believe that such elaborate patterns could have developed in a fortuitous way, we should expect to find the uppersides of the hindwings of moths exhibiting similar brilliant colours and conspicuous patterns. We should expect it also in the case of the undersides of moths, were it not that this is exposed during the most critical period of their lives, while they are drying their wings. We can understand the need of inconspicuous colours on the underside, although it is only exposed for a short period. As an actual fact we find that very few moths have bright colours on the upperside of the hindwings. The majority of those which do so are day-flying species. Too high a proportion of day-flying moths are

brightly coloured for this to be an accident, and they belong to groups too widely separated for it to be accounted for on grounds of affinity. Of our native *Geometrae* we may cite *Bupalus piniaria*, *Fidonia* (*Macaria*) *limbaria*, *Pseudopanthera macularia*, *Eulype hastata* and *Odezia atrata*; of our *Noctuidae*, *Agrophila trabealis*, *Acontia luctuosa*, *Euclidia mi*; of Bombyces, *Diacrisia sanio*, *Parasemia plantaginis* and *Saturnia pavonia*. In the case of many day-flying *Noctuae* the upperside of the forewing is protectively coloured, that of the hindwing brightly coloured. Examples are: *Anarta myrtilli* and *A. cordigera*, *Heliothis tenebrata* and *Euclidia glyphica*. *Brephos parthenias* and *notha* are further instances and are now regarded as *Geometrae*.

If we look for similarly coloured insects amongst the nocturnal species we find a very much smaller percentage in the British Isles, chiefly in the genera *Catocala* and *Triphaena*. *Triphaena* is readily disturbed by day and *T. interjecta* has a regular daylight flight in the afternoon. *Catocala*, too, is readily disturbed by day. Some of the tropical *Catocalidae* are even more ready to fly in the sunshine; for instance, the genus *Spirama* with peacock eye-spots.

These facts make it probable that there is some real advantage to be obtained by the display of a bright and conspicuous pattern in flight. This advantage, of course, cannot be obtained by nocturnal species.

The crepuscular butterflies with which I am acquainted, *Amathusia*, *Melanitis*, and some of the *Hesperidae*, are dull coloured like nocturnal moths, as are many of the *Satyridae* which fly in the shade of deep forests in the Tropics.

It will be noticed that I have left out of my list of bright coloured diurnal moths the *Zygaenidae*, *Callimorpha*, *Euchelia jacobeae*. It is well established that these are protected to a varying degree from various enemies by distasteful qualities. Such protected species are conspicuous both at rest and in flight and as a rule are sluggish. In the Tropics large and important groups are protected in this way from birds. In various areas distasteful species of widely different groups have similar colour and pattern and form Müllerian groups, and in other cases distasteful species are mimicked by edible ones forming examples of Batesian mimicry. All these fall outside the present discussion.

Other species with a bright colour or conspicuous pattern are quite inconspicuous when at rest in their natural surroundings, as, for instance, some hawkmoths and the emeralds; or they resemble a conspicuous inanimate object, like *Cilix glaucata*, which looks like a bird-dropping.

Such insects, which appear conspicuous in the cabinet, are just as much protectively coloured as those which resemble part of a rock or tree-trunk. If we take it as proved that the bright colours of the edible diurnal Lepidoptera, which form the great majority, are not fortuitous, but have been evolved for some definite purpose, the question arises as to what this purpose is. In some cases of sexual dimorphism when the male is bright and the female dull in colour the Theory of Sexual Selection affords an explanation. The parallel between the

male birds with ornamental plumage and the brilliantly coloured males of some Lycænids and other Lepidoptera is a close one. Even here we meet with difficulties.

In some cases in which both sexes are alike and perhaps dull coloured, elaborate courtship has been observed, but the appeal may be to some sense other than that of sight. For we know very little of the senses of insects. Only last year the elaborate scent organs of the males of some of the Trichoptera were discovered and described by Moseby in the " Transactions of the Entomological Society."

We know that many Lepidoptera, in which the sexes are very similar, as well as those where sexual dimorphism is marked, possess scent scales or scent organs, but we know very little about them. Even in cases where we suppose that the bright male is coloured to attract the opposite sex, as in *Agriades coridon*, we find that courtship as a rule is practically non-existent. Field observations show that pairing takes place before the wings of the female are dry, and that often the most worn and battered male is successful.

Yet in a species like this we should expect to find an elaborate courtship. Some naturalists have stated that butterfly vision is very poor and that they have no perception of colour. This would be a fatal objection to this theory as applied to dimorphism of colour and pattern. Fortunately, the latest experiments by Dr. Eltringham, suggest that at short distances butterflies see quite clearly and that they do possess colour vision.

When we come to butterflies and diurnal moths which possess a bright and conspicuous colour-scheme alike in both sexes it becomes more difficult to believe that it has arisen in consequence of the influence of sexual selection.

To accept this we must believe that it developed at first in the male and was then transmitted to the female. It may be so, but it seems improbable.

We must seek an explanation of their colouring by examining the habits of those enemies which capture them when the colours are displayed. These enemies are birds.

The most recent and reliable observations on the feeding habits of birds show that, although they seldom pursue butterflies in the open, they catch large numbers as they fly in and out of bushes and other shelter, often when they are feeding or ovipositing. They capture their prey by a quick snap, but seldom make further efforts if they fail at the first attempt.

If we examine the pattern of unprotected (*i.e.* edible) butterflies and moths, we find numerous devices to protect them from this kind of attack. In many *Lycaenidae* which are fond of flitting about bushes and settling on leaves, we find a combined tail and eyespot near the anal angle of the wing, and this is made more conspicuous by the insects' habit of slightly rotating each hindwing in turn. This with good reason is supposed to attract the attention of a bird and lead to it striking at a part of the wing which projects beyond the abdomen rather than at the real head and thorax. The number of specimens

symmetrically shorn of the anal angle supports this view. This is only useful to these butterflies while they are settled.

But the device gives us an indication of the true value of tails which are so common in *Papilio*, in butterflies of other groups, such as *Charaxes*, and in many day-flying moths and even in pale species which fly at early dusk. Ocelli near the apex of the forewing or near the anal angle are probably of use in the same way. These are a common adornment of very different families. They are specially common in the *Satyridae*, and occur in *Vanessa io*, in *Saturnia* and *Nyctipao*. The white spot near the posterior angle of the wing in *Orygia antiqua* and others serves the same purpose. The coloured tip to the forewings in many Pierines such as *Euchloë*, *Teracolus* and *Hebomoia* is another example.

One of the commonest markings found in the most distantly related groups of diurnal moths and butterflies is a conspicuous band or row of spots, often white or cream-coloured, running obliquely across the forewing near the apex. It is especially common in Nymphaline butterflies. *Lethe confusa* is a good example from many amongst the Satyrids. At least one species of *Abisara* is marked in this way, and several of *Brassolis*. Even the distasteful Danaines and Euplœines sometimes show it, and this suggests that it is of great antiquity. The whole outer margin of the wing may be coloured as a strong contrast to the rest, as in *Euranessa antiopa*, or only a part of the outer border, usually that of the hindwing. This pattern too is met with in many distant groups.

But, even if we grant that the apex of the forewings or the anal angle of the hindwings, or the outer margins of the wings, which are furthest from the vital parts of the insects, are frequently ornamented in a particularly striking way and are so ornamented to attract attack upon a non-vital part, we are left with a very large number of highly decorated species to which this cannot apply.

One such type of decoration is the chequered pattern found in Argynnids, *Pyrameis cardui*, *Pararge megaera*, and many others, another is the transverse striping of black and white or black and chestnut, which occurs in most of the *Neptis* group, *Symbrenthis*, *Abrota*, and *Libythea* in the Old World and in *Melinaea*, *Eucides*, *Mechanitis* and *Metamorpha* in the New. Some of these are distasteful, but I think the pattern itself did not originate as a warning one.

The vertical tiger-like striping of some Papilios such as *Iphiclides*, and the single oblique stripe running across both pairs of wings and converging towards the tip of the abdomen and common to many groups, form further instances. It is white on a black ground in *Limenitis* and in *Cynestis strigata*, but in other groups many pale colours are met with. Looking over the *Rhopalocera* of the World one cannot help being struck by the repetition of certain patterns in diurnal genera far removed from one another in structure, habitat, and in geographical range.

Can these serve the same purpose as the directing marks of the others? The war has taught us the value of camouflage applied to moving objects such as ships. Is it possible that these distinctive

patterns and colour-schemes act as a protection to Lepidoptera in a somewhat similar way?

The butterfly or moth is denied much of the advantage of camouflage by the fact that it must be symmetrical on both sides, but I am by no means sure that it does not gain some protection in this sort of way. Perhaps a better word than camouflage is the term "dazzle colouration."

Imagine that a butterfly feeding unnoticed, or one at rest assimilating with its surroundings and unseen by its enemy, a bird, is disturbed. It takes to flight and suddenly shows a variegated and brilliant upperside. Can this confuse a bird for a second or two? If it can it may save the insect's life, for it is the first moments when close to the bird that are the most dangerous. Once out of reach the bird is unlikely to pursue it seriously. I am not at all sure that a uniformly and soberly coloured insect would not be much easier for a bird to catch under such circumstances than one conspicuous in colour and pattern.

Again, a butterfly or day-flying moth flitting round a bush to feed might catch the eye of a bird more easily with its brilliant display of colour and markings than a dull coloured one, but it might more easily deceive its enemy into making an ineffective stroke. One unsuccessful stroke might save it, because pursuit with repeated attacks is seldom undertaken by a bird. In the case of insects of different habitat and different modes of life generalisation can be carried to a dangerous extent. No doubt many of our difficulties are due to imperfect knowledge of the habits of Lepidoptera and of their enemies. But yet when one meets with these colour schemes and patterns recurring in different groups throughout the world it should be possible to generalise correctly on their true meaning.

One difficulty which will always remain is the impossibility of seeing butterflies through a bird's eyes. Other difficulties can be removed by careful observation and careful notes of successful and unsuccessful attacks on different species. If possible the butterfly, which escapes, should be captured and any injury accurately described. In this way a mass of facts can be accumulated and analysed, and this may go far towards laying a sure foundation on which we may build up a sound theory explaining the meaning of these recurrent colour schemes, and making them as interesting to the mind as they are attractive to the eye of the Naturalist.

REPORT ON THE BIRDS OF EPPING FOREST FOR THE YEAR 1919.

In presenting the Fourth Annual Report the Committee of the Ornithological Section would specially draw attention to a fact mentioned in the First Report, *viz.* :—that certain areas of the Forest are still practically unrecorded. Records are wanted for the Forest between Wanstead Flats and Chingford and from Theydon Bois to the Lower Forest. It will be observed that the Report is now presented in an entirely new form. This has been decided upon as the result of experience gained in previous years and it is believed the new method will prove to be of greater utility for reference purposes.

Two additions and one alteration to the topographical nomenclature of Mr. E. N. Buxton's Guide are proposed, *viz.* :—the part of the Forest therein named Fairmead Bottom to be called Fairmead, and to use the name Fairmead Bottom to indicate the strip of ground between the Old and New Epping Roads, from their junction on the south at Warren House to Hill Wood on the north. At High Beach, immediately to the south of Turpin's Cave Inn lies a very characteristic little valley or hollow which it is proposed to name Turpin's Hollow.

The nomenclature adopted by the Committee in the following Report and elsewhere is that of the B.O.U. List of British Birds, 1915.

The value of the Report depends largely upon the number and variety of records received, and members and friends are invited to send these to the Secretary of the Committee, Mr. S. Austin, 43, Darenth Road, Stamford Hill, N. 16.

Carrion Crow (*Corvus corone*).—Records for the year show this species to be still increasing. Nest observed on Warren Hill.

Hooded Crow (*Corvus cornix*).—One seen on Fairmead Bottom, November 2nd.

Jackdaw (*Corvus monedula*).—Frequented Chingford Plain during winter. Nested in the tower of High Beach church as in former years—observed there June 28th.

Rook (*Corvus frugilegus*).—This species visited the Forest in large numbers during July when they were to be seen on the tree-tops—so observed on July 6th and 19th. Mr. F. F. McKenzie, Forest Superintendent, reports as follows on the Wanstead Park Rookery for 1919 :—"There were a great number of nests and they seemed to build more than ever in among the herons. We killed over 170 rooks, but still there were large numbers all the season and winter, but, strange to say, although there seemed to be more rooks than ever this spring [1920] there were not more than 50 nests in the Park."

British Jay (*Garrulus glandarius rufitergum*).—Numerous records

during the year. As many as 20 identified on one ramble, October 19th.

Starling (*Sturnus vulgaris*).—Observed in flocks during winter on Chingford and Warren Plains.

Greenfinch (*Chloris chloris*).—A number of records. Observed eating hips and haws, Warren, January 19th; feeding on hornbeam seeds, near Ludgate Plain, February 9th, and near Cuckoo Pits, March 2nd; large flock, with chaffinches and tits, near latter place on same date.

Hawfinch (*Coccothraustes coccothraustes*).—Seen feeding on hornbeam seeds, Cuckoo Pits, March 2nd: and in company with greenfinches and chaffinches (on the ground) in Chingford Wood, April 5th. Also observed on a number of other dates.

British Goldfinch (*Carduelis cardnelis britannica*).—Warren Plain, February 2nd; Warren Hill, February 16th; Highams Park, about 12 on alder, February 21st.

Siskin (*Spinus spinus*).—Several at Highams Park, February 15th; small party, with redpolls, at Highams Park, on alders, December 7th.

House Sparrow (*Passer domesticus*).—Recorded freely.

Tree Sparrow (*Passer montanus*).—Observed on Chingford Plain, July 20th, and on Whitehall Plain, October 5th.

Chaffinch (*Fringilla coelebs*).—Numerously recorded. Song first heard, Woodford Green, January 8th, and at Highams Park, February 26th; seen in courting flight, Cuckoo Pits, March 2nd.

Brambling (*Fringilla montifringilla*).—Several seen feeding with other finches on Debden Slade, April 3rd, 8th.

Linnet (*Acanthis cannabina*).—Heard singing (weakly) on Yardley Hill, May 11th.

Lesser Redpoll (*Acanthis linaria cabaret*).—Three on birches, back of "King's Oak," January 19th; small flock on alders, Highams Park, throughout February; seven seen on birches, High Beach, February 23rd; eight on alders, Highams Park, March 2nd; flock at Highams Park, April 11th; observed between Loughton and "Wake Arms," July 19th; small flock, Highams Park, December 7th.

British Bullfinch (*Pyrrhula pyrrhula pileata*).—Two seen near "Wake Arms" and one by Red Path, January 5th; five in birch spinney, Strawberry Hill, January 12th; one by Connaught Water, January 19th; Hill Wood, February 21st; Chingford Wood, female, April 5th; Gilwell Lane, October 15th; near Whitehall Plain, October 25th; one near Red Path and six near Warren, November 16th; one in Highams Park and one on Long Hills, both on December 7th; Highams Park, December 25th; and pair by Red Path, December 28th.

Yellow Hammer (*Emberiza citrinella*).—Several on Yardley Hill, the males in fine plumage, a few scraps of song heard, March 30th; Whitehall Plain, May 18th; near Fairmead, May 22nd; "Wake Arms," June 14th; (on the three preceding dates the birds were in full song); Strawberry Hill, September 8th; Yardley Hill, October 15th.

Reed Bunting (*Emberiza schoeniclus*).—Heard near Connaught Water, June 7th; seen at same place, June 14th; male seen at Fairmead, June 15th.

Skylark (*Alauda arvensis*).—Numerous records from Chingford and Whitehall Plains, and Loughton. Heard singing for first time on February 26th, golf links, Highams Park.

Pied Wagtail (*Motacilla lugubris*).—Seen on frozen lake, Highams Park, February 19th; a large number (probably hundreds) were seen coming in to roost among the reeds at Staples Hill, Loughton, November 15th, at 3.50 p.m.

Tree Pipit (*Anthus trivialis*).—The abundance of this species was one of the features of the year. First observed, April 12th, Fairmead Bottom.

Meadow Pipit (*Anthus pratensis*).—One observed near Strawberry Hill, September 8th; two at Fairmead Bottom on October 17th, and one on October 19th; High Beach, October 19th.

British Tree Creeper (*Certhia familiaris britannica*).—Observed throughout the year. In Chingford Wood, on August 4th, blue tits were observed hustling a tree creeper off a hornbeam, but the creeper returned and, in turn, drove off the tits.

Nuthatch (*Sitta caesia*).—Recorded throughout the year from Hill Wood and High Beach.

Goldcrest (*Regulus regulus*).—Seen in Highams Park March 16th and 20th; in Chingford Wood, April 5th, 6th, and November 1st; Connaught Water, December 25th. Seen on Staples Hill, near Debden Slade, and also near Earls Path, during the last week of November and throughout December—"the first seen for three years."—(P.D.H.).

British Great Titmouse (*Parus major newtoni*).—Generally recorded throughout the year. Spring note heard February 16th. Observed feeding on hornbeam seeds, October 4th.

British Coal Titmouse (*Parus ater britannicus*).—Well recorded during the year.

British Marsh Titmouse (*Parus palustris dresseri*).—Observed throughout the year.

British Blue Titmouse (*Parus coeruleus obscurus*).—Constantly observed throughout the year. Nest seen in crab tree near Bury Road, May 31st, young being fed.

British Long-tailed Titmouse (*Œgithalus caudatus roseus*).—"Although this bird has been mentioned in the daily papers as being very scarce and in places to have disappeared, in the forest district its numbers appear much as usual"—(P.D.H.). Nest being built in Chingford Wood, March 23rd; nest completed near Connaught Water, April 9th, but the snowstorm on the 27th proved fatal, as one of the birds was found dead on the nest a few days later.

Great Grey Shrike (*Lanius excubitor*).—On December 25th, at Warren Plain, a bird of this species was seen perched, in characteristic shrike fashion, on the topmost twig of a tree. After being watched with the binoculars, the bird was disturbed and flew towards the observer, when the length of the tail was very noticeable. After settling again for a moment on the highest point of another tree, the Shrike then disappeared into the private grounds of "The Warren."—(W.E.G.).

Red-backed Shrike (*Lanius collurio*).—Seen at Fairmead Bottom, May 12th; pair at Warren Hill, May 17th; pair at Whitehall Plain, May 18th; male with one young bird on Almshouse Plain, July 6th; pair at Warren Hill, July 12th; one at Fairmead, August 24th.

Whitethroat (*Sylvia communis*).—First observed in Chingford Wood, May 3rd; last recorded, August 31st.

Lesser Whitethroat (*Sylvia curruca*).—First noted, on April 25th, at Strawberry Hill Pond.

Garden Warbler (*Sylvia simplex*).—Song first heard on May 10th, Bury Wood.

Blackcap (*Sylvia atricapilla*).—First heard on May 7th, at Loughton; last seen, September 8th.

Willow Warbler (*Phylloscopus trochilus*).—First observed, April 17th, at Black Bushes; nest found, Whitehall Plain, May 18th; young being fed, Cuckoo Pits, August 24th; last recorded, August 30th, Chingford Wood.

Wood Warbler (*Phylloscopus sibilatrix*).—Recorded at Bury Road, High Beach, Highams Park, Chingford, Jack's Hill, Loughton, Staples Hill, Wake Arms and Woodford Green. First heard, May 7th, at Loughton; nest being built, May 12th, Woodford; nest found with six young, May 31st, Loughton; young just out of nest, June 15th, Turpin's Hollow, High Beach.

Chiffchaff (*Phylloscopus collybita*).—Numerous records. First heard, April 3rd, thickets near Strawberry Hill; first seen, April 6th, Bury Wood.

Missel Thrush (*Turdus viscivorus*).—Loughton, February 16th; three at Highams Park, March 2nd; Bury Wood, April 6th; Whitehall Plain, May 18th; Yardley Hill, October 15th; Whitehall Plain, December 1st; Long Hills, seen feeding on holly berries, December 7th.

British Song Thrush (*Turdus musicus clarkii*).—Commonly observed. Song first heard on February 23rd, at High Beach.

Redwing (*Turdus iliacus*).—Heard at Turpin's Hollow, High Beach, January 1st; Warren Plain, January 12th, 19th; near Connaught Water, January 18th and February 8th; flocks near Friday Hill frequently "charming," March 29th; many on Whitehall Plain, October 17th, 19th, 25th; Fairmead Bottom and Warren Plain, very numerous, November 2nd, 16th; heard at Long Hills, December 7th.

Fieldfare (*Turdus pilaris*).—Highams Park, February 20th, 22nd; Fairmead Bottom, May 6th; Yardley Hill, October 12th; Fairmead, in good numbers, November 16th; Gilwell Lane, December 6th; Highams Park, December 25th.

Blackbird (*Turdus merula*).—Constantly recorded throughout year. Abnormally numerous in Highams Park on October 10th, where there was a good crop of berries. The greatest number identified on one walk was 15, October 15th.

Redstart (*Phoenicurus phoenicurus*).—Frequently recorded. First seen at Fairmead Bottom, April 25th; young bird seen, Chingford Wood, June 29th; Ludgate Plain, August 23rd; several on Warren

Plain, one at Strawberry Hill, and one at Old Church Plain, August 24th; one at Hatch Plain, August 30th; one at Strawberry Hill, and many at Warren Plain, August 31st.

British Redbreast (*Erithacus rubecula melophilus*).—Numerous records. Earliest song, February 26th, Warren Hill; latest song, November 2nd, High Beach and Hill Wood.

Common Nightingale (*Luscinia megarhyncha*).—Records from Chingford Plain, Connaught Water, Fairmead Bottom, Ludgate Plain, Red Path, Theydon Bois and Whitehall Plain. Song first heard at Fairmead Bottom, April 23rd.

Whinchat (*Saxicola rubetra*).—One observed on Fairmead Bottom, May 23rd.

Hedge Sparrow (*Accentor modularis*).—Seemed more numerous than last year. Fairmead, February 8th; between Chingford and Loughton, in song, February 16th; Hawk and Bury Woods, in song, April 6th; Chingford Plain, in song, May 3rd; Connaught Water, in song, May 4th; Ludgate Plain, in song, May 10th, 24th; several heard singing, Connaught Water, July 20th; Chingford Plain, in song, September 21st; several at Yardley Hill, October 15th.

Wren (*Troglodytes troglodytes*).—Records throughout year from Bury Wood, Buttonseed Corner, Chingford, Cuckoo Pits, Fairmead, Hawk Wood, Highams Park, Mount Pleasant and Old Church Plain. Song recorded in April, May, and December.

Spotted Flycatcher (*Muscicapa grisola*).—First seen between Chingford and Theydon, June 15th; Woodford Green, June 21st; Theydon Bois, July 19th; Highams Park, numerous, August 30th; Strawberry Hill, two, and Fairmead, two, August 31st: Connaught Water, two, and Strawberry Hill, one, September 8th.

Swallow (*Hirundo rustica*).—Seen at Fairmead Bottom, April 9th; Warren Plain, May 17th; Highams Park, June 28th; High Beach, July 19th; a fair number about generally, August 24th; Chingford Plain, August 31st; over Chingford and Warren Plains, September 21st.

Martin (*Delichon urbica*).—Numbers seemed less this year. Highams Park, May 18th; High Beach, June 15th; Whitehall Plain, June 28th; High Beach, July 19th; Chingford Plain, August 24th, 31st.

Sand Martin (*Riparia riparia*).—Woodford Green, May 11th; High Beach, June 15th.

British Great Spotted Woodpecker.—(*Dryobates major anglicus*). —Species seemed more numerous this year. Almshouse Plain, August 10th; near Bury Road, March 23rd, May 10th; Bury Wood, April 6th; Buttonseed Corner, October 15th; Chingford Wood, January 18th, May 3rd, 4th, 11th, 18th, 24th. 25th, 31st, June 1st, 14th, 15th, 28th, July 6th, 19th; Connaught Water, December 7th; near Cuckoo Brook, January 11th, 18th, March 15th, October 26th; Cuckoo Pits, May 4th, July 19th; Highams Park, February 24th, April 25th, 28th, May 18th, August 17th, December 7th; Hill Wood, February 21st, 22nd, August 24th, December 7th; Warren Hill, December 28th; Woodman's Glade, August 23rd, September 27th;

Yardley Hill, December 6th. A portion of a blown-down branch of a beech tree (in which this species had nested), from Chingford Wood, has been placed in the Forest Museum, together with photographs of the tree.

Lesser Spotted Woodpecker (*Dryobates minor*).—High Beach, February 23rd; Strawberry Hill, two, April 24th, one, April 30th.

Green Woodpecker (*Picus viridis*).—Seen and heard frequently throughout year. Records from Chingford Plain, Connaught Water, Debden Slade, Fairmead, High Beach, Highams Park, Hill Wood, Ludgate Plain, Loughton, Old Church Plain, Strawberry Hill, and Whitehall Plain. One bird observed moving backwards down bough, near Ludgate Plain, March 1st; another seen feeding on ground among anthills, but there were no signs that the ants' nests were being attacked, Whitehall Plain, October 25th.

Cuckoo (*Cuculus canorus*).—Commonly reported during May and June. First heard, Fairmead Bottom, April 25th. Female note heard, Whitehall Plain, May 18th.

Swift (*Micropus apus*).—Numbers about as usual. First observed, May 5th, Loughton.

Nightjar (*Caprimulgus europoeus*).—First seen, May 15th, Clay Ride (D.P.H.); "Wake Arms," 3 males flushed, no females seen, June 28th; Wake Valley, two young birds found about a week old—male bird flushed at another place, June 28th (R.H.F.).

Kingfisher (*Alcedo ispida*).—Connaught Water, January 12th; seen upon several occasions during February, at Highams Park Lake; nest found at Woodford Green, May 10th, young flown from nest, May 19th; one seen flying over the bushes on the Verderer's Path at Woodridden Hill, July 6th; Highams Park, seen fishing, July 17th; Wake Valley Pond, September 5th.

Tawny Owl (*Strix aluco*).—Heard hooting at "Warren House," 6 p.m., January 1st; frequented Chingford and Bury Woods—observed there April 6th and May 10th; Loughton, February 22nd; Woodford Green, February 24th.

Sparrow Hawk (*Accipiter nisus*).—One flushed on Fairmead Bottom, November 16th, flew off with prey (which had the appearance of a blackbird) in its talons.

Kestrel (*Falco tinnunculus*).—Almshouse Plain, February 2nd, 23rd; Ludgate Plain, March 30th; Red Path, July 20th; old bird hovering and two young birds flying round, Highams Park, September 28th; Fairmead Bottom, October 10th; Hawk Wood, October 15th; Hill Wood, High Beach, November 15th; Whitehall Plain, December 7th.

Mallard (*Anas boschas*).—Flying over Chingford Wood, January 11th; on pond at Fairmead, February 23rd; four or five rose from flooded brook near Ludgate Plain, April 5th; two at Cuckoo Pits, April 5th; two flying over Chingford Wood, April 6th; female on Connaught Water, May 6th; two flying over Warren Pond, May 18th; three flying, Highams Park, June 28th; Connaught Water, one, August 31st, two, September 21st, one, October 17th; Highams Park, several, October 10th; 32 on Connaught Water, December 28th.

Pochard (*Nyroca ferina*).—Three females on Highams Park lake, February 27th, 28th.

Tufted Duck (*Nyroca fuligula*).—Highams Park lake:—one female, March 2nd; one male and four females (in full plumage) March 9th; four males and four females, March 17th; seven males and three females, April 11th.

Common Heron (*Ardea cinerea*).—One seen, flying very low, over Cuckoo Pits, July 27th. Mr. McKenzie reports as follows on the Wanstead Park Heronry for 1919:—"I find that in March the keeper counted 47 nests, then we had nothing but floods and most of the island was under water all April; he counted them again early in May, when they numbered 54."

Woodcock (*Scolopax rusticola*).—One flushed at the back of the "Robin Hood" during the latter part of October (P.D.H.). Keeper Bynoth has on several occasions during the autumn put one or two up in the Birch Wood near Strawberry Hill pond; also in the marshy ground at the back of the "Robin Hood" (P.D.H.).

Lapwing (*Vanellus vanellus*).—Flock of about 40 flying over Fairmead, November 16th.

Black-Headed Gull (*Larus ridibundus*).—Four flying over Strawberry Hill, November 16th.

Little Grebe (*Podiceps fluviatilis*).—One on Strawberry Hill pond, April 2nd, and remained there for ten or twelve days (P.D.H.). Highams Park lake, three, October 10th.

Moorhen (*Gallinula chloropus*).—Common on Highams Park lake, as many as 35 being seen on one occasion, February 27th; Cuckoo Pits, March 2nd, July 27th, August 3rd and 4th; heard at Loughton, May 3rd, one on each Strawberry Hill pond, October 17th; Connaught Water, December 6th, 7th.

Coot (*Fulica atra*).—Highams Park lake, one, March 17th, two on June 28th.

Stock Dove (*Columba aenas*).—Strawberry Hill, September 9th.

Wood Pigeon (*Columba palumbus*).—Chingford Wood, January 18th; Hill Wood, February 21st; Blackbush Plain, May 31st; Hawk Wood, October 15th; Fairmead, two, November 16th.

Pheasant (*Phasianus colchicus*).—Male seen at Loughton, May 7th; male, near Wormleyton Pits, July 12th; male and female, near "Wake Arms," July 27th.

Partridge (*Perdix perdix*).—Yardley Hill, two, October 15th.

OBITUARY NOTICES.

Lord Walsingham.

Thomas de Grey, 6th Baron Walsingham, was born in Mayfair, July 29th, 1843, and educated at a private school near Tunbridge Wells for four years and afterwards at Eton and Cambridge. He resisted the family tendency towards Law and chose Politics, being elected M.P. for West Norfolk in 1865, retaining his seat until he succeeded to the title on the death of his father in 1870.

In 1876 he was appointed a trustee of the British Museum, to which his entomological library and collections were transferred in 1910. He held several other public offices and was a member of the Entomological Society of London, Zoological Society, British Ornithologists' Union, Linnean Society, Royal Society and other important Societies at home and abroad.

A love for Zoology in general and Entomology in particular characterised him from early youth, and innumerable monographs, papers, and notes testify to his knowledge of, and devotion to, the subject. His earliest note was written at the age of 8 in a letter from his stepmother to his father, and his first and last public contributions appeared in the "Entomologist's Monthly Magazine," in 1867 (vol. iv.) and 1920 (vol. lvi.) respectively. He began by collecting and studying the Macro-lepidoptera, but afterwards specialised on the "Micros," on which he became a leading authority, and his own collection of at least 50,000 specimens, to which he added those of Zeller, Hofmann, and other continental lepidopterists, was representative of European, American, and North African species, and is now in the Natural History Museum at South Kensington, as is also his almost complete collection of preserved larvæ of the British Macro-lepidoptera.

Lord Walsingham was elected High Steward of the University of Cambridge in 1891, and it was during the performance of duties in connection with that office in November last that he fell ill. Pleurisy supervened, and he died of heart-failure on December 3rd, and was buried in the churchyard at Merton Park, Norfolk. He was married three times, but, as he left no heir, the title descends to his half-brother, the Hon. John de Grey, the well-known London police magistrate.

W. R. Dodd.

On December 4th, 1917, W. Ralph Dodd died at his home, Burton Grange, Cheshunt, Herts, in his sixty-second year. In 1870 Mr. Dodd entered the drug trade, serving an apprenticeship of 5 years at Market Drayton, afterwards going to Bristol and later on to London, where he joined the staff of Allen & Hanburys, Ltd., subsequently becoming a director in that business. Mr. Dodd was a man of forcible

character, who combined in an uncommon degree all the advantages of wide and varied technical knowledge and experience of the practice of pharmacy with business acumen and address. His varied experience in the drug trade gave him a keen general interest in many branches of Natural History. He was a member of several Natural History Societies, though as a naturalist he specialised in no single one. His chief outdoor interests in later years were fishing, his garden and his farm. Mr. Dodd's was a gracious personality, and he commanded the esteem and affectionate regard of all who came in contact with him.

Mrs. H. A. Allpass.

Mrs. Allpass was the widow of the late Rev. H. A. Allpass, who was for 17 years Principal of the Monoux School at Walthamstow, and was at one time Chaplain of the British Legation at Monte Video. Before her marriage she was herself Principal of a large girls' school—one of those in the gift of the Drapers' Company. She was a lady with wide literary and scientific interests, highly intellectual and very well educated, having taken honours at Newnham. In addition to her educational activity she took great interest in all social welfare movements and her loss was felt by a large circle of friends.

The Society has also lost by death Lt. W. C. A. Austen of the Middlesex Regiment, killed in action in France in 1916, and Mr. C. Flowers, who died in August, 1919.

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